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OBSERVATIONS ON MATERNAL AND INFANT HEALTH IN CANADA

Jean F. Webb

THE SOCIAL ASPECTS OF EPILEPSY

Fraser Brockington

ACUTE AND CHRONIC TOXICITY STUDIES

M. G. Allmark

POLIOMYELITIS AT MAGUSE, N.W.T.

H. W. Johnsen and W. J. Wood

PARTNERSHIP IN PUBLIC HEALTH

R. D. Defries

ABSTRACTS OF 28 PAPERS PRESENTED AT THE 1953 CHRISTMAS MEETING OF THE LABORATORY SECTION



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Canadian Journal of **PUBLIC HEALTH**

VOLUME 45

TORONTO, JANUARY 1954

NUMBER 1

Observations on Maternal and Infant Health in Canada

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Ottawa, Ontario

THERE are two important objectives of good maternity care—a live and healthy mother, who is prepared in every way for the responsibilities of parenthood, and a live and healthy baby.

Judged by our increasing success in the saving of mothers' lives, we Canadians are doing quite well in the field of maternal care. The 1951 maternal mortality rate of 1.1 per 1,000 live births puts us in sixth position in the world, following the United States, Denmark, England and Wales, New Zealand, and Holland. This is a substantial improvement over our position in relation to other countries before the war. However, this commendable rate is not achieved by all provinces. The range of provincial rates is from 0.4 to 2.1 deaths per 1,000 live births.

The major causes of maternal mortality for 1951, summarized in Table I, indicate that further reduction is possible.

Toxaemia is well recognized as the major cause of death but its nature is least understood. Until such time as it is, deaths from this cause cannot be eliminated entirely. If our present knowledge of the other major causes be applied in good hospital surroundings with transfusion services and obstetrical consultations, deaths from haemorrhage, sepsis and the complications of disproportion should be rare.

The most precise way of estimating the prospect for reduction is a detailed study of the circumstances surrounding maternal deaths. Some studies are

Presented at the forty-first annual meeting of the Canadian Public Health Association, held in the Royal York Hotel, Toronto, October 1 and 2, 1953, in conjunction with the fourth annual meeting of the Ontario Public Health Association.

TABLE I
MATERNAL DEATHS, CANADA, 1951
Major Causes, Numbers and Percentage Distribution

	Number	Percentage
Toxaemia	126	31.1
Haemorrhage	101	24.9
Sepsis	51	12.6
Disproportion, prolonged or traumatic delivery	42	10.4
All other causes	85	21.0
Total	405	100.0

currently being planned and conducted. Maternal mortality studies elsewhere indicate that we are far from reaching an irreducible minimum of maternal deaths. A recent study in Minnesota compared the situation in that state in 1941 and 1951. Although the 1951 rate was 0.3 deaths per 1000 live births, it was considered that one-third of these could have been prevented with good maternity care.

Another relatively unexplored area is maternal morbidity. Our goal in maternity care is a healthy mother, able to care for her baby. And yet at times our anxiety for her survival seems to overshadow our concern for her total well-being. We need much more information regarding the impairment of maternal health which results from complications of pregnancy.

The survival of the mother is the most important index of the quality of maternity care, but there is an increasing awareness on the part of the medical profession that the survival of the baby in utero and in the neonatal period also has a close relationship to maternity care.

Maternity care in Canada is largely in the hands of private physicians. Hospital out-patient clinics are limited to large cities. Several provinces have no clinic facilities, and in others they are limited to one urban centre. In five provinces over 90 per cent of births occur in hospitals. Among the others the proportion of hospital deliveries is as low as 53 per cent. In cities and in provinces where the proportion of hospitalized deliveries is high, the feeling of many clinicians and public health workers seems to be that maternity care is reasonably good, judged by such indices as the time of first consultation with the doctor, or the maternal mortality rate. However, in one of these provinces where a detailed study was done recently, there were still deficiencies in the quantity and the quality of prenatal care, although considerable improvement was shown over the findings of a similar survey made ten years ago. By this type of study the inadequacies of present methods of care can be clearly demonstrated.

While it is difficult to assess the quality of care being given, shortages of hospital beds and shortages of doctors and nurses with special training in maternity care make it most unlikely that all mothers are receiving care of a high quality. For example, in 1951 the ratio of obstetricians to women of child-bearing age varied from province to province, from 1 to 5,000 to 1 to 71,000.

In the past public health workers have been somewhat reluctant to enter

the field of maternity care, partly because it is largely in the hands of private physicians. This is unfortunate. Without interfering in any way with the doctor-patient relationship, there is a role which the public health nurse can play better than anyone else—getting the patient to the doctor, interpreting the doctor's instructions, allaying her anxieties, teaching her personal hygiene as well as the fundamentals of infant care. This is accomplished by contacts both in and out of the home.

At present, mothers' classes, and indeed fathers' classes, are becoming an increasingly accepted part of community health services. In general, public health workers are gratified by the quality of the response to prenatal classes but are sometimes disappointed by the small numbers in attendance. There are a number of reasons for this. As in other programs of group instruction, those who would most benefit often do not attend. To reach such mothers and to change their attitude toward child-bearing and rearing from one of non-chalance to one of responsibility is a challenge to our educational methods.

Another factor in the success of prenatal classes is the attitude of local physicians. Frank opposition is rare, but condemnation by faint praise is as great a liability to public health workers. There is little doubt that this attitude could be changed to enthusiastic support in most instances if the objectives and content of prenatal classes were discussed with private physicians and their participation sought. There are those physicians who feel that the less the little woman knows about all this, the better. At the other extreme are those who are doing such a thorough educational job that their patients' needs for additional help are not great; however, these physicians are often the most appreciative of the role the nurse can play.

In summary, then, maternal health in Canada can be improved by research, better distribution of facilities for maternity care, better training of doctors and nurses and, lastly, a closer relationship between public health workers and the private physicians and hospitals providing care.

INFANT HEALTH

A matter of even more importance to the nation is infant health. In this field our national record is not as good. The 1951 infant mortality rate, 38 per 1,000 live births, puts Canada in thirteenth place in the world, essentially the same position we held before the war. There has been improvement, but there are still provinces with rates over 50, and no province has yet had a rate under 30. In contrast, the rates of New Zealand, Sweden, Iceland, and Australia have not exceeded 30 since the war years. Following a universal pattern, the greatest reduction has been in deaths of infants 1 to 12 months of age, and the least reduction in stillbirths.

Table II, which summarizes the major causes of infant mortality, indicates clearly the areas in which reductions can be made.

There is no magic formula, no one program or policy which will effect reductions from all causes. Deaths from environmental causes, still the largest and most readily preventable group, can be reduced through education of parents and through better distribution and better quality of medical services.

TABLE II
 INFANT DEATHS, CANADA, 1951
 Major Causes, Numbers and Percentage Distribution

	Number	Percentage
Respiratory infections	2,511	17.2
Immaturity	2,117	14.5
Congenital malformations	2,063	14.1
Injury at birth	1,461	10.0
Asphyxia and atelectasis	1,160	8.0
Gastro-intestinal infections	1,001	6.9
Ill-defined diseases of infancy and unknown causes	1,333	9.1
All other causes	2,938	20.1
Total	14,584	100.0

There are few areas in which more urgency is required than in the treatment of severe infections of infancy.

One index of the quality of medical services for infants is the availability of paediatricians. In the Provinces of Canada the 1951 ratio of paediatricians to children under 15 years of age varied from 1 to 10,000 to 1 to 140,000.

As suggested before, better obstetrical practice should bring about a considerable reduction in deaths from birth injury and asphyxia and atelectasis, and should reduce the incidence of prematurity. There are indications that the obstetrical profession is well aware of this responsibility. A co-ordinated study of stillbirths and neonatal deaths has been initiated in Toronto by a group of obstetricians, paediatricians, and pathologists. The results of this type of investigation should indicate very clearly how infant lives can be saved through better maternal care.

Deaths from congenital abnormalities are least susceptible to reduction, but there are indications that a more thorough knowledge of the environmental factors in maternity care, such as nutrition, may one day reduce the incidence of congenital abnormalities.

Having been born alive, the infant must next risk the hazards of his care in hospital. I have had a unique opportunity to visit hospital services for newborn and premature infants. Because many of them have been in capital cities and university centres, I have probably seen the best facilities rather than the worst, but even in these centres the quality of care can be greatly improved. The recognized inadequacies of hospital newborn care are all too prevalent: overcrowding, large nurseries, lack of hand-washing facilities, frequent handling of babies on common dressing tables, poor methods of formula preparation, use of propped bottles to feed babies in nurseries, lack of educational programs for mothers, and so forth. While many of the shortcomings can be attributed to lack of space and physical facilities, just as many are the result of inadequate medical supervision and inadequately trained personnel.

The most serious single problem of the newborn period is prematurity, which is responsible for 25 per cent of neonatal deaths. Until recent years the extent of this problem was unknown. Now the inclusion of birth weights on the birth registrations of eight provinces is providing precise information

regarding the number of premature infants born annually. This information, along with better reporting of deaths of prematures, will enable us to assess more readily our progress in this important field.

It is only too clear to any observer that there are few centres in this whole country where first-quality medical and nursing care are provided for this special group of newborn infants. By first-quality care is meant separate physical facilities, adequate space, sinks, incubators, oxygen, paediatric supervision, and trained nursing supervision. Even this is not enough unless a good working relationship between the hospital and a public health agency has been developed so that the mother and the home are prepared to care for this special baby, and the mother is assisted in every way after the baby has been discharged. It is very difficult to say how many centres are needed to provide adequate care. More are necessary, some of which must be available to infants born outside large cities.

Care in the newborn period is the first hurdle that must be passed; the next objective is the health supervision of the infant. Recognition of the value of health supervision to support and advise mothers in all aspects of the care of babies, through regular contacts with physicians and public health nurses, has contributed immeasurably to the improvement of infant health. This education begins in the prenatal period through discussion of such matters as the value of breast feeding, and is continued during hospitalization when the mother has an opportunity to learn to know her baby before supervision in the usual sense begins.

The role of public health workers in providing health supervision is well established. Well-baby clinics or child-health conferences have been operating in all our major cities for many years, and services are rapidly spreading into rural areas. Full credit must go to official and voluntary public health agencies for making this service available to Canadian mothers and babies. However, there are some rumblings of unrest. Some doctors feel that patients are being weaned away from them; and, on the other hand, there is the attitude of the public health nurse who said that she always had trouble with young paediatricians in their feeding of coeliacs but they usually came around to her methods. As public health workers we sometimes lose sight of the fact that the services provided by well-baby clinics are designed to supplement, not supplant, the services of the family doctor. For this reason the amount of service provided by the clinic will vary. Babies under the supervision of paediatricians need the services of the clinic least. Other physicians often wish to delegate to the clinic much of the supervision of the well baby. This is frequently the case in rural areas where the demands of therapeutic medicine allow doctors less time for preventive work, or may be the case with physicians anywhere whose main interest lies outside the field of paediatrics. The objective of the infant health program is to ensure that all babies are under supervision, not that all babies receive supervision in any one way.

There need be no fear that health services provided to infants by health agencies will fall into disrepute as long as the quality of service is maintained by constant critical appraisal. This will ensure that the information given mothers is consistent and in line with the best available knowledge of child care.

In summary, infant health, in common with maternal health, can be improved through research, better distribution of facilities and services, and better training of doctors and nurses. These needs are obvious, but the objective will not be reached by these means alone. They must be accompanied by better understanding and closer working relationships between workers in the fields of preventive and therapeutic medicine.

Co-operative planning on the part of these two groups for the utilization of the special knowledge and skills of obstetricians, paediatricians, hospital and public health workers will result in comprehensive health services for mothers and infants such as we have not seen before. Only then can we expect Canada's record in the field of maternal and infant health to become a matter of national pride.

Partnership in Public Health

R. D. DEFRIES, C.B.E., M.D., D.P.H.

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Connaught Medical Research Laboratories

University of Toronto

YOU WILL BE reminded by the program that this is the forty-first annual meeting. The Canadian Public Health Association has, therefore, a rich heritage. The Canadian Journal of Public Health, now in its forty-fourth volume, has been published since 1910. It succeeded the Canadian Sanitary Journal, first published in 1873 by Dr. Edward Playter, a practising physician of Toronto and a pioneer in the public health movement. In the first issue of the Journal Dr. Playter stated: "Its purpose is to diffuse a knowledge of, and awaken interest in, the laws of health; to advocate sanitary legislation; and to make prevention rather than cure the first object of both the physician and the public."

In the years that followed, Dr. Playter outlined his vision of what public health might accomplish and spoke of the need for a provincial department of health in each province; of a national health association, with a national journal devoted to health; and of a Dominion department of health. As one reads the issues of this journal, published seventy-five years ago, one is impressed by the enthusiasm of its editor for a new type of medical practice in which the physician would be the family health adviser; by his energy in petitioning the Ontario and the Dominion Governments to establish official departments of health; by his conviction that a national health association was needed; and by his financial sacrifices in maintaining the Journal.

In 1892 Dr. Playter established a national health association, the Dominion Institute of Health, but the organization was not successful and was disbanded. Almost two decades passed before a Canadian public health association was formed to carry on the activities that Dr. Playter had visualized. In 1910, at a meeting of the Dominion Commission of Conservation, in Ottawa, the delegates voted to establish a Canadian public health association. Ontario Letters Patent were applied for, and issued on September 22. The first public meeting was held in the Parliament Buildings, Ottawa, in November. Dr. T. A. Starkey, professor of hygiene at McGill University, was elected president; Major Lorne Drum, Ottawa, general secretary; and Dr. George D. Porter, Toronto, treasurer. The Public Health Journal, first published in 1909 by Dr. D. M. Anderson and Dr. L. M. Coulter, was made the official publication of the Association, although continuing under private ownership. The first annual congress of the Association was held in Montreal in December, 1911, under the patronage of Lord Strathcona and with Dr. Starkey as president. In April of the following year a Dominion charter was granted the

Presidential Address, presented at the forty-first annual meeting of the Canadian Public Health Association, held in Toronto October 1 and 2, 1953, in conjunction with the fourth annual meeting of the Ontario Public Health Association.

Association and Dr. Charles A. Hodgetts became the first national president. The second annual meeting was held in Toronto in 1912 and the third in Regina in 1913 under the presidency of Dr. J. W. S. McCullough; both were outstandingly successful.

The years of the first world war seriously affected the Association's development. Financial difficulties were encountered and the discontinuance of the Journal was threatened. The Association is particularly indebted to Dr. George D. Porter, who during these years generously contributed to the maintenance of the Journal. At the Association's 1916 meeting, held in Quebec City, a reorganization of the publishing company was undertaken, and a small group of members agreed to give financial support to the Journal in order that its publication might be continued. Dr. Gordon Bates was one of these members, and for more than ten years rendered notable service to the Journal and the Association as editor.

The situation continued to grow more difficult and by 1928 the Association was in serious difficulty. Amalgamation with other agencies was considered. It was suggested that more effective service might be given under the aegis of the American Public Health Association than if a Canadian association functioned independently. Was there a place in Canada for a national public health association? What services could the Association render for those in public health work? Should the objective be the interpretation of the modern health movement to the public through campaigns of popular health education, or should this work be left to the national agencies that had been established to meet the needs in the special fields of venereal-disease control, mental hygiene, and child welfare?

At the annual meeting in Winnipeg in October, 1928, fundamental decisions were made by the Executive and endorsed by the Association. As it was appreciated that the needs and interests of Canadian public health workers, in their Provincial and Federal relationships, could best be met by a Canadian organization, the decision was made to continue the Association. Its field was defined as the advancement of public health through the more effective functioning of public health personnel, to be achieved in part by the establishing of qualifications and by the publication of a scientific journal. It was recognized that, to be effective, the annual meetings should be technical in character, and it was decided that the Association's work could be most effectively conducted through national committees which would undertake studies of specific problems with the co-operation of health departments and universities.

An option to purchase the Journal was given the Association by the owners, and arrangements were completed whereby the Journal would become the property of the Association at the end of 1928. In January, 1929, with the publication of the twentieth volume, the name was changed to Canadian Public Health Journal.

THE WORK OF THE ASSOCIATION

Fundamentally, the Association serves as the professional society in public health. However, because the field is public health, the Association must be

regarded as much more than a professional society. Its members are, for the most part, in the public service. Its objectives are the advancement of public health, which is the concern of the community as well as of the individual. It brings together all who are in public health work and it is recognized as the body qualified to speak for them. The decision of 1928, when the Association redefined its functions, was the occasion for a new program.

Briefly, the Association is organized in sections, twelve in number, serving special fields: Public Health Administration, Laboratory, Vital and Health Statistics, Epidemiology, Venereal Disease Control, Public Health Nursing, Public Health Nutrition, Dental Public Health, Public Health Education, Sanitation, Industrial Hygiene, and Mental Hygiene. Several of these sections—notably Vital and Health Statistics, Public Health Nursing, and the Laboratory Section—have made important contributions to the advancement of public health in Canada.

The Association functions through national committees, with the participation of public health leaders from all the Provinces. The Committee on Professional Education is of special importance to health workers and health departments alike. The committee has established qualifications for various public health appointments and has recommended minimum salary schedules for the different positions in public health. The Committee on the Certification of Sanitary Inspectors has defined educational standards, provided training through a correspondence course, and conducted examinations for more than eight hundred prospective sanitary inspectors; in this function the Canadian Public Health Association is unique, its charter permitting it to serve as an educational authority. Other committees have made important contributions in the field of vital statistics, public health practice, and laboratory work. Through its Committee on Social Security the Association is studying the place of public health and preventive medicine in a national health program.

The Association has held a national meeting every year since 1912, with the exception of three war years. Through these meetings, the Association has influenced public health thinking, government action, and public interest. Resolutions embodying the views of Canadian public health authorities have been endorsed and submitted to the appropriate agencies for consideration and action. The Canadian Public Health Association is the voice of the public health profession. It has been credited with soundness of judgment and its recommendations have been welcomed by federal, provincial, and municipal health authorities.

This, briefly, is the history and purpose of our Association, devoid of reference to the public health leaders whose loyalty and support have made possible its continuation. For forty-three years the work of the Association has been conducted by members who have given generously of their time to its needs.

I have been interested in the Association since 1913. I well recall the 1914 meeting in Toronto, when I was most impressed by the concern of the group of public health officers for the development of the Association. As my relationship goes back so many years, perhaps I may express some thoughts which centre in the word "partnership."

PARTNERSHIP IS ESSENTIAL

During the past few years the Association has taken a great step forward in the formation of provincial public health associations, of which there are now seven: la Société d'Hygiène et de Médecine Préventive de la Province de Québec, the Ontario Public Health Association, the Alberta Public Health Association, the Atlantic Branch (serving Nova Scotia), the Manitoba Public Health Association, the New Brunswick-Prince Edward Island Branch, and the British Columbia Branch. Membership in these provincial associations is open to everyone in public health. Each holds an annual meeting, at which representatives from all parts of the province meet to discuss provincial and local problems.

But the establishing of provincial associations will not answer the Association's fundamental need unless there is adequate support for them. There is a failure to realize that the Association depends upon the participation of *all* who are engaged in public health work. Somehow it is felt that the Canadian Public Health Association is maintained by "others." I speak frankly of the problem. It is most difficult to develop a sense of individual responsibility for our public health association. There are nurses, engineers, sanitarians, dentists, health educators, statisticians, veterinarians, and physicians. Public health workers are much more conscious of their participation in the professional society of the field in which they obtained their training. Although the Canadian Public Health Association is the professional society of those who are in public health work, it lacks the cohesion of a common professional background that constitutes the strength of the medical, dental, nursing, and other professional societies. Yet the success of the Canadian Public Health Association and its seven provincial branches depends upon a participating membership. The provincial associations will survive only if those engaged in public health realize that the Canadian Public Health Association is their professional organization in public health—and become a member of their provincial public health association and, in turn, of the national association. The one fee covers membership in both the provincial and the national organizations. In several of the provincial associations the response to membership appeals has not been as encouraging as it should be. The membership fee has been kept at a minimum. This fee is not adequate for the financing of the Association, but in order that the provincial associations might enroll one hundred per cent of the public health workers, the Executive have not desired to make a change at this time.

Individual acceptance of responsibility for the Association—acceptance of partnership—will bring success to your own provincial public health association and, in turn, to the Canadian Public Health Association.

The Canadian Journal of Public Health should be essential to you as a public health worker. Each year the twelve issues constitute a year book of public health, presenting the newer knowledge in many fields. The idea is quite prevalent that it is sufficient to scan the pages of the copy that is available in the offices of the health department. But if the Association is to improve the Journal and extend its service, every public health worker must have his own copy and utilize it to extend his knowledge. Those who feel that the

Journal has little of interest to them must remember that their service and their satisfaction in their work are dependent on a knowledge of the whole field of public health.

It is the hope of the Executive Committee that the Journal may be provided to every public health worker, without charge, as part of a plan in which the services rendered by the Association will be paid for by the Provincial Departments of Health. For many years the Provincial Departments have assisted the Association by making the Journal available to medical officers of health and other members, and without this assistance it would not have been possible for the Association to continue. Unless those who receive the Journal under the new plan understand the reason why it is being provided through the Provincial Department and make full use of it, the continued publication of the Journal will be jeopardized.

Two aspects of the partnership, then, are 100 per cent enrollment in your provincial public health association, and a copy of the Journal on every member's desk.

At its 1953 sessions, the Executive Council considered the interrelationship of membership in the provincial organizations and the national association, and the ways in which the essential financial support for the national association may be provided. The Provincial and Federal Departments of Health have acceded to the Association's request for the recognition of its work on the basis of services rendered. This action is evidence that these authorities appreciate the work of the Association in the advancement of public health in Canada.

But encouraging as this support is, the maintenance of the national association—and the continued existence of the provincial branches, can be assured only through the co-operation and support of every public health worker. Words of appreciation and expressions of interest are no substitute for active membership and participation in the responsibilities of our national and provincial public health associations.

Letter from Great Britain

The Social Aspects of Epilepsy

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THE British Epilepsy Association, founded as a memorial to Tyler Fox, recently organized a two-day course on epilepsy at the Manchester University's Holly Royde Residential Adult Education College, at which I was privileged to take the chair. The symposium of many contributors, expert in their own field, which might be called "the social aspects of epilepsy", was addressed to a widely representative audience consisting of medical officers of health, school medical officers, welfare officers, mental health workers, almoners, disablement rehabilitation officers, psychiatric social workers, and others of various interests.

Epilepsy presents two main problems: to secure an education to fit the age, aptitudes and ability of the child; and to obtain for every epileptic adolescent and adult an occupation in which he can earn to full capacity without danger to himself or his employer, and from which a normal life in society can be maintained.

The principles of medical diagnosis and treatment were dealt with by Dr. Liversedge, Lecturer in Neurology at the University of Manchester, who spoke about the many different types of attack and the disturbance of electrical pattern. He emphasized the value of the special centre for expert study and prescription, and we were left in no doubt that such a centre should exist in each of the 14 regions of our national hospital system. The advantage still remains with wise clinical assessment, for the value of E.E.G. in the great bulk of idiopathic epilepsy is limited. Ninety-nine per cent of epileptics can be diagnosed on history and in 20 to 30 per cent of cases of typical epilepsy the E.E.G. is normal. The value of E.E.G. lies more with symptomatic epilepsy in correct diagnosis and localization, and in localizing abnormal areas during operation. Treatment by drugs, to the end of diminishing attacks to a minimum, is mainly by a combination of phenobarbitone with epinutin. Mysoline also is proving to be successful. Tridione, which has considerable therapeutic value in certain forms of petit mal, and paradione can be lethal. Petit mal, which is rarely symptomatic, is not often seen over 35 years and can be treated in the hope that it will have improved or disappeared by the age of 20 years.

The significance of the school was handled by Dr. William Eldridge, Senior Medical Officer of the Lancashire County Council. With early diagnosis and

full medication, our aim should be to avoid the development of the epileptic personality and to ensure education within the normal school setting. This is a challenge to the school health staff, including the school doctor and the health visitor, whose influence on the home and the school can often determine the issue. Until recently the ascertainment of epilepsy in school children has been limited to those in need of special schooling in a residential school. The Ministry of Education has now extended this requirement to all epileptics, thus ensuring that all epileptic children become the subject of social case study, both during the school years and at the critical time of school-leaving. Approximately 1 in 10 epileptic children has been sent to the six residential schools (a seventh school, the first new one for many years, has recently been opened by the Lancashire County). Until recently the number thought to be in need of special schooling has much exceeded the available accommodation, and many severe cases have been unable to gain admission. It has been customary to exclude children of low intelligence. The much wider appreciation of the significance of epilepsy, including better therapy and the value of education in the normal school, has more recently redressed the balance. The value of ascertainment during school life is increasingly evident. Continuous social case study is helping to bring together the many factors which affect the prognosis and which would otherwise go uncoordinated. Health departments operating school health services are now appreciating the advantages of a central register in charge of a professional worker. This provides the machinery for continuous supervision without the break at school-leaving, which the Ferguson report showed to be so disastrous to the disabled youth of Glasgow ("Employment Problems of Disabled Youth in Glasgow"). The London scheme, outlined by Miss Gregson, Principal Organizer of Children's Care in the L.C.C. Public Health Department, uses 150 medical social workers and 2,000 voluntary workers operating in areas under care committees. The care committees' mandate is not confined to health nor, of course, to epilepsy. The social workers are part of the school health team and they attend medical inspections, clinics, and hospitals. The London central register contains the names of 382 epileptic children, 349 of whom are in ordinary schools and 33 in residential epileptic schools. It is far from clear whether it is better to use the social worker or the health visitor for this work. The great advantage of the London scheme lies in the value of personal contact to lead parents towards their own decisions rather than through the use of authority. In these new and untried fields we need to keep an open mind.

In the second day of our conference we left the realms of medical diagnosis and the years of school life to get out upon the hard road of life itself, in the unsheltered community where the second main problem lies. We talked about welfare in the sense both of the welfare machinery of the National Assistance Act (1948), and of voluntary agencies; and we studied the epileptic from the point of view of the industrial medical officer and the disabled resettlement officer.

The Chief Welfare Officer of Manchester City spoke of the responsibility of the "welfare committee" as outlined in the Ministry of Health Circular 32/51 to survey the area for the ascertainment of all the "substantially and

permanently" handicapped. Manchester City is the only authority to have responsibility for an epileptic colony: all other colonies are under voluntary bodies. To many people's astonishment, epileptic colonies were not taken over by the hospital service. Mr. Ryan considered that the epileptic fell naturally into this group without any precise medical diagnosis or prognosis, although the meeting generally thought that it would be impossible to regard all epileptics as both substantially and permanently handicapped. The Manchester welfare department settles epileptics in collaboration with the D.R.O. The meeting discussed the establishment by welfare committees of sheltered workshops, which might be in conflict with the Remploi factories of the Ministry of Labour. In general, it was felt that epileptics should not be segregated. The greatest need was for hostels in which epileptics could find a temporary home during the often difficult task of finding lodgings. Many now in colonies, and many others who drift to the colony, could be helped towards stability within society by this simple means. But the welfare authority has no power to set up hostels except as part of a sheltered-workshops scheme. Attention was called to powers to provide such hostels, given to the housing authority under S. 40 of the Housing Act, 1949. This power might be used more freely in agreement with the welfare committee, which would need to appoint a suitable warden. Mr. Ryan stated that it would be retrograde to tie welfare with health. The evidence of the Society of Medical Officers of Health, submitted to the present committee, which is now sitting on the problems of the disabled, states that welfare is a necessary part of health and that the welfare work of the National Assistance Act should be placed with the health department. This is at present done in only 33 of the 144 Counties and County Borough Councils. Here is a point of considerable interest that will no doubt be hotly contested. It is of significance to all countries.

Dr. Williamson, who until recently was Regional Medical Adviser of the Ministry of Labour to the Manchester area, spoke of the type of work an epileptic can do and of the attitude of employers. After a long experience, he found himself unable to lay down any rigid formula as to what work an epileptic should or should not do. This must be decided on an individual basis. The window cleaner whose aura always gave him enough warning to get down to terra firma was a classical example. When we say that "the epileptic should avoid work that is essentially dangerous", what do we mean? No more than that each individual epileptic must be carefully studied and his attacks related to the work in question. The suspicious and unfriendly attitude of employers, so well depicted in the film "Seizures", and that of other workers, is often based on a single example of an epileptic mishap; from one particular case they generalize and rationalize their objection. Insurance companies are said to object because of the liability to accidents, but the examples given—e.g., falling into a pot of glue—are usually the same for the non-epileptic as for the epileptic; why was the glue pot not fenced in? Loss of work from absence is exaggerated. The objections of fellow workers are those of ignorance and could be dispelled by explanations. The British Epilepsy Association, by the creation of propaganda, can do much to change attitudes.

The D.R.O., Mr. Phillips (Group Disablement and Resettlement Officer,

Manchester Area), sympathized with the employer's excuses; a quarter-hour loss of work for the whole shop could be a real disadvantage. The employer quite genuinely feared the effect on other workers, and their fears must continue until dispelled by education. But we are very ignorant yet of the full significance of industry to epilepsy, and vice versa. Under the Disabled Persons Registration Act, 1944, 1.7% of registered persons are epileptics. Of these, 80% are employed, but we do not know how many are not registered because they have given up hope of work, and how many are in secure jobs who have not thought it necessary to register. We know very little about the turnover of jobs, but it is obviously very great. In terms of employment, Mr. Phillips placed the significant factors in the following order of importance: frequency of attack, adequacy of warning, degree of skill, intelligence. To him as a layman the most important need was for the control of fits, for, on the whole, industry could only accommodate persons with epilepsy in minor forms.

Mr. H. Halstead, Educational Psychologist and Honorary Secretary of the Birmingham Branch of the British Epilepsy Association, spoke of the Club for Epileptics which began in Birmingham in January 1953 and where thirty-five epileptics meet in the evening. Many of the club members say that this has changed their lives. No one has a fit while at the club. The club may help to develop self-reliance and in some measure the happiness of a stable environment, which epileptics so commonly lack. Epileptics suffer from loneliness. Set apart from others, an object of attitudes, sympathy, curiosity, fear, they tend to withdraw into themselves and become asocial. This asocial characteristic is found in nearly half the cases without correlation with the nature of fits or the age. Many epileptics are "reserved" or "dependent", prefer their own company, or never go out of the home. The psychological aspects of the epileptic would provide a great field for research. We need to know much more of what they are and what they require.

In the final discussion, much emphasis was laid upon the present inadequacy of our epidemiological picture of epilepsy. It was said that only one in ten is getting adequate treatment. In this, as in much else, we could see the significance of ascertainment during school life. Not only can school ascertainment give us most of the information that we require, but it can also form the basis upon which to develop social case work. With this information, we should be in a position to supply the epileptic's greatest needs. His opportunity for a successful and happy life lies in early, careful diagnosis and treatment, leading to normal schooling, followed by individual guidance into industry.

An Outbreak of Poliomyelitis at Maguse River, N. W. T.

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IN OCTOBER, 1953, an outbreak of poliomyelitis involving seven cases, with three deaths, occurred at Maguse River, N.W.T. Maguse River is a tiny settlement seventeen miles north of Eskimo Point, which is two hundred miles north of Churchill, Manitoba, on the west shore of Hudson's Bay.

The population at the time of the outbreak consisted of thirty-six Eskimos and five white persons. The Eskimos were from two bands or family groups. Eighteen were from Southampton Island and eighteen were Padleimiuts indigenous to the area. The white persons who were not affected by this disease were two missionaries, their wives, and one child.

On August 10, 1953, the Southampton Islanders crossed to the mainland and set up their tents near the missionaries' house at Maguse River and at a hunting camp at Maguse Lake, thirty miles west. There was some travelling to Eskimo Point, where the nearest Hudson's Bay Post is situated. In mid-September four of these Eskimos travelled north with the Royal Canadian Mounted Police boat from Eskimo Point to Chesterfield Inlet, Wager Bay and Repulse Bay, to hunt walrus. They spent several days at Chesterfield Inlet on the way north and at Rankin Inlet on the way south. The Eskimos returned to Maguse River on October 15th.

On the 19th of October, Jasper, one of the Southampton Island Eskimos who had travelled north with the R.C.M.P., became sick, with headache, pain in the neck, and fever. A few days later he developed weakness in his arms and legs and was confined to bed.

Three weeks later another Eskimo, Joe Gibbons, who had lived with Jasper and had moved to the hunting camp at Maguse Lake, became ill and was brought back to Maguse River. The trip was made with great difficulty because there was little snow and much slush. The R.C.M.P. came over from Eskimo Point and gave artificial respiration, but Joe died of respiratory paralysis on November 9th.

A young Eskimo, Anoolik, who had brought Joe to Maguse River, developed severe back ache on his way back to Maguse Lake. He reached his camp with great difficulty and died one and a half days later (November 14th). A young woman, Okoyuk, became ill at this camp at this time and died on November 13th. During the period October 19th to November 15th seven other Eskimos became ill and developed various degrees of paralysis, principally in the legs.

The outbreak was reported to the Indian Health Services by the R.C.M.P. and the doctor at Chesterfield Inlet, with a probable diagnosis of poliomyelitis.

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Owing to the unusually warm weather at the time, ice was not of normal thickness for aeroplane landing (Eskimo igloos were melting and the natives had to return to tents), and it was not until November 15th that we were able to get a plane in with a doctor and a nurse, to investigate the outbreak. The diagnosis was confirmed clinically on physical examination of the patients, who were in various stages of recovery, and from the history of these and the three who had died.

Thus in the community of thirty-six Eskimos there were three deaths and seven cases of paralysis—a death rate of 8.3% and an attack rate of 27.7%. If only the Eskimos from Southampton Island are counted, the death rate is 16.6% and the attack rate 55.5%. Seven males and four females were affected (including the one non-paralytic case). All seven surviving cases had some degree of paralysis of one or both legs. One had a weakness of the eye muscles and one had weakness in an arm and a leg. Only one was considered severe enough to bring south for physiotherapy.

Older age groups were more severely attacked than younger ones. Six paralytic cases occurred in the 21–60 age group and only four in the 0–15 group.

Ages	Total Population	Paralytic Cases	Deaths
0-5	4	0	0
6-10	3	2	0
11-15	4	2	0
16-20	1	0	0
21-30	4	4	2
31-40	1	1	1
41-60	1	1	0
	18†	10*	3

†Southampton Island Eskimos only.

*Including deaths.

Gamma globulin was given to twenty-five Eskimos who had not reported illness.

No further cases have been reported to date.

DISCUSSION

This small outbreak is of interest due to the fact that all deaths and cases of paralysis were among the Eskimos from Southampton Island. There had been no evidence of poliomyelitis when they left the Island, nor has any been reported there since. One of the Padleimiut women was ill for a short time with headache, fever and stiff neck, but did not develop paralysis. There was close association of all Eskimos in the area, for they are addicted to continuous social life and excessive hospitality. The only conclusion one can draw to explain why the Padleimiuts did not develop poliomyelitis is that they acquired some immunity during the winter of 1948–49, when an epidemic of severe poliomyelitis swept this coast, culminating in the outbreak at Chesterfield Inlet (1). This did not extend to Southampton Island. The 1953 outbreak at Maguse River showed greater virulence than that at Chesterfield Inlet in 1949 and indicates the unpredictability of poliomyelitis in a relatively non-immune population.

Our thanks are extended to Mrs. Joan Edwards, R.N., a field nurse in Indian Health Services, for her valuable assistance.

REFERENCE

1. Adamson, J. D., et al.: Poliomyelitis in the Arctic. *Canad. M.A.J.*, 1949, 61: 339.

Observations on Acute and Chronic Toxicity Studies

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THE problem of acute and chronic toxicity becomes more and more important to the public health as our consumption of synthetic material increases from year to year. The exposure of the population to increasing quantities of synthetic products in foods, drugs, cosmetics, household items, clothing, etc., increases the possibilities of poisonings. One source of possible poisoning which is uppermost in our minds at the present time is that due to the spraying of fruits and vegetables with insecticides for insect control which has given rise to the spray-residue problem.

In order to control these possible sources of poisons it is necessary to evaluate all specific and related information so as to determine the quantitative amounts which may cause harm, and if necessary to establish tolerances and regulations. It is the responsibility of the toxicologist and those in related sciences to decide if new chemicals can be handled, applied and utilized safely. For the newer substances and also some of the older ones which have not been properly investigated, it is necessary to design and carry out toxicological investigations and make proper evaluations of the data obtained. A brief summary of suggested procedures is as follows:

1. Pharmacodynamics:
Blood pressure; respiration; heart rate; organ perfusion; isolated tissue preparations; etc.
2. Acute Toxicity:
Dosage-response curves on three or more species; objective symptoms; statistical calculations for comparative studies; simultaneous comparative determinations of other substances.
3. Subacute Toxicity:
Large daily doses to one or more species for 6 to 12 weeks; gross and microscopic pathology.
4. Chronic Toxicity:
Three or more species; at least one species for the whole life span of the animal; several dosage levels graduated to produce from no effect up to marked effect, and possibly shortening life span; gross and microscopic pathology.
5. External Effects:
Sensitization; skin irritation; mucous membrane irritation.
6. Special Studies:
Reproduction; hematology; absorption and excretion; distribution and storage; effect of diet.

This is a general plan and it can be changed to fit the individual case. A brief discussion of the separate examples is presented.

A study of the pharmacodynamics of a substance often gives considerable

useful information and usually provides one with preliminary data for further work. It also provides information on the mechanism of action of the poison and may suggest a suitable antidote. Effects on blood pressure, heart rate, respiration, nerve reflexes, smooth muscle motility, etc., can be observed in dogs, rabbits, or cats or on isolated organs or tissues.

The next step is to determine the acute toxicity of the material and the objective symptoms produced. For this purpose, the acute oral, intraperitoneal, intravenous, or subcutaneous dose should be determined on at least three species. The rat, mouse, and guinea pig are usually used. Rabbits and cats are preferred by some investigators, in addition to the three other species. Sufficient numbers of animals are used on several dosage levels so that it will be possible to estimate the LD_{50} . This dose can be most accurately estimated (1). It is also desirable to compute the slope of the dosage-mortality curve and its error so that comparisons may be made with other similar data (2).

There will be certain substances which act through inhalation or skin absorption, and the procedure for determining acute toxicity should be changed so as to make the test applicable to actual experience (3).

Sub-acute toxicity studies serve as a useful guide in the design of chronic experiments. In this type of experiment rather large quantities of material are fed to or injected daily in one or two species of animals, preferably rats and one other species such as dogs, monkeys, or guinea pigs. The experiment is carried on for 6 to 12 weeks. At the end of this time the animals are sacrificed and gross and microscopic pathology are observed. The dosage should be high enough to produce a rather marked effect.

Experiments on the effect on growth can be included in the sub-acute toxicity studies. Animals at weaning age (21–28-day-old rats) are placed on experiment in such a manner that there are adequate controls. The substance can be given in the diet, be injected, or be given in any applicable manner. These experiments continue for at least 12 weeks, at which time the period of maximum rate of growth has been passed.

When this information has been obtained, a chronic experiment can be planned. In some cases the sub-acute experiments can be extended to cover a longer period of time. It is considered advisable that these feeding experiments should be continued for at least the life span of one of the species. The rat seems to be the best species for this purpose. In planning these experiments it is advisable to use several dosage levels of equal gradation, from the dose sufficiently high to cause marked effect to a dose low enough so that there are no observable differences between the experimental and control animals. The question has often been asked concerning the value of these long-term studies. This can best be answered by some examples taken from the literature. It was necessary to feed arthoaminoazotoluene to rats for 200–300 days in order to produce true experimental liver tumours (4). Ethylene glycol fed to rats in the diet at 1% and 2% levels produced kidney and bladder stones in both species, but in those animals surviving less than 15 months no stones were found (5). Bladder stones and tumours, generally fibropapillomas, developed in rats after prolonged feeding with a diet containing 4 per cent of

diethylene glycol (6). Neurofibromas developed in rats fed crude ergot (5%) in the diet after 12 months on this diet (7). These are just a few examples but there are many more, especially in chronic studies on lead, arsenic, fluorine, selenium, and cadmium, where long-term experiments have revealed important information. It should be remembered that pathological studies are an important part of chronic toxicity experiments. Significant histopathological changes sometimes appear before gross changes occur (8).

There are a number of substances which may exert their toxic effect by single or continued contact with the skin. A study of the sensitizing and irritating properties of these substances is an important part of every toxicological investigation. Investigations have revealed that the white male guinea pig is the best species for conducting sensitization tests (9). For the study of the irritating properties of a drug, the albino rabbit is the animal of choice when primary irritation of the skin is involved (10). Another test which is often used for irritant properties is the installation of the substance in the conjunctival sac of the eye of the rabbit or some other animal (11). Some investigators believe that the results of tests made in rabbits correspond more closely to the effects produced on man than any other species.

There are a number of other studies which come under the category of special studies. One may often find a clue to the preventive measures which can be taken to avoid some of the results of the toxic actions of a particular substance, e.g., reproduction studies are really a part of chronic toxicity experiments and should reveal whether the substance in question will affect fertility, lactation, size of litters, and mortality of the young. Hematological observations are frequently of value in conjunction with the long-term chronic experiments. The presence of anaemia, leukopaenia, etc., is usually an indication of toxicity, which may appear before there are other obvious signs. Moreover, these observations and others often lead to valuable diagnostic methods for the detection of specific toxic effects. The cholinesterase test for parathion poisoning is an example (12).

An estimation of the probable effect of a toxic agent will often be obtained from a knowledge of its absorption, excretion, distribution, and storage. If there is an indication of storage, we should watch for cumulative toxicity. If no storage occurs, the toxicity from cumulation likely will not be as serious as the chronic toxicity of a toxicant which may result from the passage of the poison through the system. Some minerals are a more serious problem as air contaminants than when they are ingested, because of their low solubility in the gastro-intestinal tract and consequent poor absorption. Silicon is possibly a good example. Some coal-tar colours used in foods and drugs are eliminated rather rapidly and thus have a rather low toxicity. The most likely focus of toxic action is sometimes indicated by the concentration of a poison in the tissues and organs. For example, mercury is found in the highest concentration in the kidney and this organ has been found to be most severely affected in mercury poisoning (6).

In recent years the possible effect of diet on toxicity has been the subject of a number of investigations. For example, it has been found that high protein diets partially protect against selenium toxicity (13), dimethylaminoazo-

benzene (14), and other compounds. The toxicity of lead and rate of storage are influenced by the concentration of calcium in the diet. High levels of calcium in the diet exert some prophylactic effect in lead intoxication (15).

When it is convenient, it is preferable to test a series of similar substances. By doing this a great deal more information can be obtained. It should provide a better background for evaluating any one substance. Such comparative information is useful, because it often happens that the substance can be tested alongside a substance whose toxicity for man is known (2).

It is generally agreed that investigations must be carried out on different species of animals before a substance should be used as a drug, food additive, or pesticide. The information obtained enables one to interpret observations made on human beings accidentally or industrially exposed to such substances.

Interpretation of Toxicity Data

The interpretations placed on toxicological data are numerous and complicated and very frequently their applicability to man is not easy to discern. Possibly the best way to discuss this aspect of the problem is to present some of the factors in outline form.

1. Variation between species:

- (a) Response of different species to a single substance
- (b) Response of different species to different substances

Contributory factors to the above differences in response are relative surface area and organ capacity, and differences in absorption, metabolism, detoxification, and excretion.

2. Variation between individuals in the same species:

- (a) Normal distribution and heterogeneity of the population

(b) Physiological condition

- Age, sex, weight
- External environment
- State of physical exertion
- Pregnancy and lactation
- Presence of food in gastro-intestinal tract.

(c) Pathological condition:

- Renal, cardiac, and hepatic insufficiency, etc.
- Presence of infectious organism
- Nutritional deficiencies.

(d) Multiple Exposures.

There are wide variations among species in their response to most toxic substances. Man is more susceptible to the majority of these substances than any other species (16). Guinea pigs are very susceptible to copper and mercury, while rats and mice are relatively resistant. On the other hand, guinea pigs are more susceptible to some of the organic amines than are rats and mice. If toxicological experiments have been carried out on several species, and especially if comparative studies with known poisons have been done, the probable level tolerated by man can be estimated. It is rarely possible to make a direct determination from lower animals to man in terms of milligrams per kilogram of body weight (17). To give an example, a rat can tolerate 100 milligrams of lead per kilogram of body weight for at least a year and survive. In terms of a 70-kilogram man this would mean 7,000 milligrams per day. This is possibly 5,000 times the amount that can be tolerated (15).

Species differences are undoubtedly a reflection of differences in physiology. The ratio of body weight to surface area, relative size of organs, vital capacity, etc., varies from species to species. Detoxification mechanisms and metabolic processes are likewise recognized differences.

It is generally apparent to most investigators today that there are variations among species, but what is not quite so apparent is the wide variations among individuals of the same species. There is a normal distribution in reactions to poisons just as there is a normal distribution in the heights and weights of men and women. And just as there are a few very tall and a few very short persons, so will there be a few very susceptible and a few very resistant persons to a given poison. Such a distribution can be easily demonstrated in animals by computing the slope of the dosage response curve (1). It is known that some poisons give a graded effect over a fairly wide range of concentrations while others are limited to a fairly narrow range (18). As the human population is quite variable, the graded response to most poisons will be over a wide range of concentrations. It must be remembered in applying animal toxicity data that we must allow for a probable flattening of the dosage-response curve for man, because experimental animal colonies show less variability in response to poisons.

The toxicity of the poison may be influenced by age, sex, and weight. It has been reported that the toxicity of glycols in guinea pigs is affected by the size of the guinea pig (17). Physicians take cognizance of this when prescribing for children and adults. Variations due to sex are most marked during pregnancy and lactation. The environmental temperature has an effect in the response to the action of some substances, as has been demonstrated in rats for morphine, paraldehyde and pentobarbital sodium (19). Physical exercise may directly and certainly can indirectly affect the results of exposure to a toxic agent. During strenuous physical exercise, one will breathe more air and in that way become exposed to more of an air contaminant. The flushing of the skin in exercise may permit greater skin absorption of toxic agents. Moreover, the individual doing heavy physical work will eat more and drink more than the sedentary worker, and thus be exposed to greater quantities of a possible toxic agent. There are no doubt many other conditions which affect toxicity.

The nutritional state of the animal plays a part and no doubt influences the results of toxicological investigations. There is not much doubt that some of the discrepancies in results between laboratories are due to differences in the nutritional state of the animals.

Animal experiments for the most part are carried out on healthy animals, but many of the general public who will be exposed to these substances will not be healthy, normal persons. It seems apparent, then, that it is the duty of the pharmacologist to take cognizance of those chronic poisons where actions are specific for certain organs and tissues, and may be potentiated by such pathological conditions.

In studying a toxic agent, one is likely to be considering only his own particular problem. However, one should not forget that the public is exposed to other poisons every day. There is always the possibility that some of these

poisons may have an additive or synergistic effect. Therefore, it becomes necessary to consider all possible sources of poisoning at the same time, in order to come to a proper conclusion.

SUMMARY

To better understand the problem of acute and chronic toxicity resulting from exposure to toxic substances, well-controlled toxicological investigations must be carried out. For these experiments it is essential that levels causing acute, sub-acute, and chronic toxicity be accurately determined in several species of animals. Chronic studies should be continued for the lifetime of the animal. Since the results of these experiments on animals are to be interpreted in terms of man, and since the tests are made upon normal animals under ideal conditions, all factors related to species variation and individual variation must be kept in mind when evaluating toxicity data in formulating tolerances or regulations for the protection of the public.

REFERENCES

1. Bliss, C. I.: *Quart. J. Pharm. & Pharmacol.*, 1938, *11*: 192.
2. Allmark, M. G.: *J.A.Ph.A.*, 1951, *40*: 27.
3. Carpenter, C. P., Smyth, H. F., Jr., and Pozanni, U. C.: *J. Indust. Hyg. & Toxicol.*, 1949, *31*: 6.
4. Yashida, T.: *Gann*, 1935, *29*: 795.
5. Morris, H. J., and Calvery, H. O.: Unpublished data, Food and Drug Administration, Washington, D.C.
6. Sollman, T.: *A Manual of Pharmacology*, 7th ed., pp. 108 and 961. Philadelphia and London: W. B. Saunders Co., 1948.
7. Nelson, A. A., Fitzhugh, O. G., and Morris, H. J.: *Am. J. Path.*, 1941, *17*: 624.
8. Patterson, W. I., and Lehman, A. J.: *Assoc. Food & Drug Officials*, 1953, *17*: 3.
9. Landsteiner, K., and Jacobs, J.: *J. Exper. Med.*, 1935, *61*: 643; 1936, *64*: 625, 717; 1937, *66*: 337.
10. Draize, J. H., Woodward, G., and Calvery, H. O.: *J. Pharmacol. & Exper. Therap.*, 1944, *82*: 377.
11. Draize, J. H., and Kelly, E. A.: *Proc. Sci. Sect. Toilet Goods Assoc.*, 1952, *17*: 1.
12. Kay, K. et al.: *Arch. Ind. Hyg. & Occup. Med.*, 1952, *6*: 252.
13. Lewis, H. B., Schultz, I., and Gortner, R. A.: *J. Pharmacol. & Exper. Therap.*, 1940, *68*: 292.
14. White, J.: *T. Natl. Cancer Inst.*, 1940, *1*: 337.
15. Calvery, H. O.: *J.A.M.A.*, 1938, *111*: 1722.
16. Calvery, H. O., and Klumpp, T. G.: *South. Med. J.*, 1939, *32*: 1105.
17. Laug, E. P., Calvery, H. O., Morris, H. J., and Woodward, G.: *J. Ind. Hyg. & Toxicol.*, 1939, *21*: 173.
18. Gaddum, J. H.: *Med. Res. Council, Spec. Rep. Series*, No. 183, 1933.
19. Herrmann, T. B.: *J. Pharmacol. & Exper. Therap.*, 1941, *72*: 130.

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A STRIKING REDUCTION IN TUBERCULOSIS MORTALITY IN CANADA

THE mortality rates for tuberculosis in Canada for 1952 have recently been published by the Dominion Bureau of Statistics. Compared with the figures for 1951, there has been a dramatic reduction in the number of deaths, representing approximately 30 per cent. In 1951, 3,422 deaths were recorded from tuberculosis, and in 1952 there were only 2,457. The mortality rate fell from 24.5 to 17.1. In no previous year has the fall in tuberculosis mortality been so great, and it is evident that the downward trend is being accelerated.

The rates for the ten Provinces are of special interest. Newfoundland recorded a reduction from 70.9 in 1951 to 46.8 in 1952; Quebec, from 38.3 to 26.5; New Brunswick, from 26 to 19; British Columbia, from 25.1 to 17.9; Manitoba, from 20.5 to 14.4; Nova Scotia, from 19.6 to 14.4; Saskatchewan, from 19.0 to 12.3; Alberta, from 15.5 to 12.9; and Ontario, from 12.6 to 8.4. Only Prince Edward Island reported an increase, from 17.3 to 23.3; but it is to be noted that an unprecedentedly low figure had been recorded in 1951.

Study of the sex and age distribution of tuberculosis deaths shows that the ratio of male to female deaths was approximately 3 to 2. This indicates a remarkable fall in the number of female deaths. For a number of years a change in the age distribution has also been evident. The peak of the death rate used to be centered in the young adult group. There has been a continuous movement of the peak of deaths from the younger age groups to the older age groups. Approximately twice as many deaths occurred in the age group 20-29 as in the age group 10-19 years, and approximately the same number of deaths in the age group 30-39 years as in the group 20-29 years. A very marked increase in male deaths occurred in the next decade, with still higher figures for males in the age group 50-70 years. In contrast, the largest number of deaths of females occurred in the age group 20-29 years. There was a steady decline in the following decades, so that in the age group 60-69 years there were only 88 female deaths in contrast to 260 male deaths.

Contributing to the fall in the death rate are the advances in treatment, including chemotherapy, surgery, and radiology. The prevention of tuberculosis by vaccination, using B.C.G., has a real place in the tuberculosis-control

program in Canada, as a result of the pioneer work of Dr. Armand Frappier and his colleagues in the Province of Quebec, and of Dr. R. G. Ferguson in Saskatchewan.

Encouraging as is the fall in the mortality rates, tuberculosis is still a major health problem. The data of the survey teams in Ontario have shown approximately one case in 1,500 of those examined in 1951 and one case in 1,400 in 1952. The tuberculosis problem presents, therefore, a somewhat confusing picture. There are several authorities who believe that although the mortality rate is falling, the incidence of the disease shows little evidence of decline. Certainly the occurrence of 2,457 deaths is a challenge to the public health authorities. Valuable as are the advances in treatment, intensive use of case-finding methods and the supervision of contacts are of prime importance in the control of tuberculosis.

Ontario has the honour of having the lowest tuberculosis death rate in Canada. This has been achieved by years of continuous effort under wise leadership. It is gratifying that Dr. G. C. Brink, director of the Division of Tuberculosis Prevention in the Ontario Department of Health, was recently honoured with the degree of LL.D. by Queen's University. For more than thirty years, Dr. Brink has given outstanding leadership in Ontario and, through the Canadian Tuberculosis Association, in tuberculosis-control programs across Canada.

FORTY-SECOND ANNUAL MEETING

Canadian Public Health Association

Château Frontenac, QUEBEC

May 31 - June 2, 1954

**ABSTRACTS OF PAPERS PRESENTED AT THE TWENTY-FIRST
ANNUAL CHRISTMAS MEETING OF THE LABORATORY
SECTION, CANADIAN PUBLIC HEALTH ASSOCIATION
TORONTO, DECEMBER 14 AND 15, 1953**

Laboratory Diagnosis of Some Virus Diseases of Poultry.

JOHN E. FAHEY, *Connaught Medical Research Laboratories, University of Toronto.*

INFECTIOUS BRONCHITIS (IB), Newcastle disease (ND), and chronic respiratory disease (CRD) are the major respiratory disease problems in Canadian poultry flocks.

IB and ND are both caused by viruses and hence diagnosis of these diseases depends to a certain extent upon the isolation and characterization of the specific etiological agent. Other tests, such as virus neutralization for both IB and ND and hemagglutination inhibition for ND, have widespread application and are discussed in detail. A survey of Canadian poultry flocks using the above tests has revealed that, in 1952-53, 8.9% of flocks were infected with ND and 75% with IB.

At the present time pleuropneumonia-like organisms (PPLO) are believed to play an etiological role in CRD. Diagnosis of this condition depends upon isolation of PPLO, which can be grown either in embryonated hen's eggs or in artificial media. One property of this agent, namely, its ability to elicit a sinusitis when injected into the infra-orbital sinus of a turkey, is commonly utilized in a diagnostic laboratory. This disease is egg-transmitted and there are indications that a high percentage of Canadian poultry flocks are affected.

Studies on the Propagation of Influenza Virus in Tissue Culture.

H. M. BURR, M. E. CAMPBELL, J. F. MORGAN, and F. P. NAGLER, *Laboratory of Hygiene, Department of National Health and Welfare, Ottawa.*

A STUDY has been made of the propagation of influenza virus (PR8 strain) in various chick embryonic tissues suspended in a synthetic tissue-culture medium. Finely minced fragments of chorio-allantoic membranes from 11-day-old fertile eggs, suspended in mixture 199, have been found to yield virus titres comparable to those obtained in embryonated eggs. The optimal ratio of tissue to suspending medium has been established, the variation between replicate cultures measured, and the rate of virus propagation determined. Using stationary flask cultures, the extracellular virus production from tissue fragments suspended in mixture 199 has been compared with its production in tissues suspended in Tyrode's solution and in serum ultrafiltrate. A rapid and convenient method for studying the influence of a chemically defined medium on virus propagation in tissue culture is presented.

Etude épidémiologique de la pénicillino-résistance des staphylocoques dans la Province de Québec.

ARMAND FRAPPIER et ROGER DESJARDINS, *Institut de Microbiologie et d'Hygiène de l'Université de Montréal.*

DANS LE CADRE d'une enquête épidémiologique sur l'incidence des infections à staphylocoques pénicillino-résistants dans la Province de Québec, particulièrement dans les pouponnières des centres hospitaliers, les auteurs ont recherché la fréquence des souches trouvées résistantes d'emblée chez les sujets n'ayant jamais reçu de pénicilline.

Dans un rapport préliminaire portant sur les 160 premières souches éprouvées par la méthode des disques des taux de résistance à la pénicilline de 74.7% (r. modérée) et de 51.4% (r. forte) sont présentés.

"Typing" of *Staphylococcus pyogenes* by Means of Lysogenic Phages.

GERTRUDE KALZ, *Department of Bacteriology and Immunology, McGill University, Montreal.*

THE USEFULNESS of phage typing of *Staphylococcus pyogenes* for epidemic purposes is restricted at present by a number of factors. The most important limiting factor is the large percentage of untypable strains (20-40%) encountered in most investigations.

The reason for this may be roughly either an insufficient number of phages in the presently used series (Wilson-Atkinson) or latent phages carried by these strains which interfere with the action of the phages used in typing. This latter possibility has been investigated and the results will be discussed. From our observations so far it appears that grouping or typing of strains by means of the carried phage might be possible.

A Fatal Infection due to *Listeria monocytogenes*.

A. E. ALLIN, *Regional Laboratories, Department of Health of Ontario, Fort William, and*
DEAN KEMPER, *Port Arthur, Ontario.*

THE PATIENT, an adult male, had complained of indefinite illness for two days. On the third day he suffered from severe headaches. The following morning he became confused and lost consciousness. On admission to hospital marked neck rigidity was present. His rectal temperature was 105° F. A lumbar puncture was performed and the cloudy fluid contained 3000 cells per c.m.m.; 90 per cent of these were polymorphonuclear leucocytes. No organisms were found on direct smear or on culture. *Listeria monocytogenes* was isolated from a blood culture taken on this date. Despite penicillin and sulphadiazine therapy, the patient died twelve hours after admission.

Originally isolated in England in 1926, *L. monocytogenes* is now recognized as a parasite of warm-blooded animals with a world-wide distribution. In Canada it has been recorded from sheep, cattle, chinchillas, lemmings, chickens, and canaries. Although numerous cases have been reported from other countries, this appears to be the first case of a human infection reported in Canada. The problem of its recognition on routine examination of clinical material is discussed.

Listeriosis in Lemmings.

MARION MAGUS, *Division of Laboratories, Department of Health of Ontario, Toronto.*

A SURVEY of listeriosis in lemmings, *Dicrostonyx groenlandicus richardsoni*, was carried out with two groups:

(a) Lemmings trapped in the Fort Churchill area during the months of July and August; these lemmings had never lived in captivity.

(b) Lemmings that were confined to or born in the Defence Research Northern Laboratory at Fort Churchill and died there during the same period.

On the basis of bacteriological studies conducted on the two groups of lemmings, it appears that listeriosis is either rare or not present in animals in their natural habitat during the summer months. From lemmings confined in the laboratory, however, it was possible to isolate *Listeria monocytogenes* from fifty per cent of the animals that died during the same period.

A Comparison between Disk-Plate and Tube-Dilution Methods for Antibiotic Sensitivity Testing of Bacteria.

ANNE M. COLLINS, *Department of Bacteriology, The Hospital for Sick Children, Toronto.*

STRAINS OF seven bacterial pathogens (*D. pneumoniae*, *Streptococcus hemolyticus*, *Staphylococcus aureus*, *Hemophilus influenzae* type B, *Shigella sonnei*, *Ps. aeruginosa*, *E. coli*) were tested for sensitivity to eight antibiotics by a tube-dilution method and by a disk-plate method employing Bacto-Sensitivity Disks (Difco).

Disk results were differentiated into five classifications from "very sensitive" to "resistant" and similar degrees of sensitivity were attributed to suitable ranges of concentration of each

antibiotic for tube-dilution interpretation. Correlation was considered to be good when the results differed by not more than one degree.

Of 1,377 tests, good correlation was obtained in 1,257 (91.3%).

Good correlation was seen in 98.4% of tests with chloramphenicol; 97.7% with polymyxin B; 97.5% with bacitracin; 96.6% with erythromycin; 94.7% with terramycin; 92.8% with penicillin; 85.4% with aureomycin, and 68% with dihydrostreptomycin.

Better correlation usually occurred in strains which, by tube-dilution, were either very sensitive or resistant, than in strains which were of intermediate sensitivity. The strains were very sensitive in 530 tests and in 402 they were resistant.

Defective disks were noted in 15 of 181 penicillin determinations.

In 38 tests (2.8%) either there was no correlation whatever, or the disks were not interpretable largely due to the initial zone formed being overgrown by the test organism. The latter was particularly evident with aureomycin.

Typing of Canadian Poliomyelitis Strains by Tissue Culture Methods.

DARLINE DUNCAN and A. J. RHODES, *The Hospital for Sick Children, Toronto.*

DURING THE PAST YEAR, an attempt has been made to obtain stool specimens from authentic cases of poliomyelitis occurring in many different centres in Canada, so that the antigenic types of poliomyelitis present in the entire country could be studied. Primary isolation of the virus was carried out by the inoculation of an ultracentrifuged extract of stool into Maitland-type cultures of minced monkey kidney, suspended in synthetic Mixture No. 199 (Morgan, Morton and Parker). Supernatant fluid removed from the flasks was inoculated into groups of roller tube cultures of monkey testicular tissue in Mixture No. 199. As soon as degenerative changes were noted in this first subculture, a second subculture was initiated. When cytopathogenic changes occurred in this subculture, the fluid was removed for typing. The typing method used was a simple neutralization technique. The patient's virus was mixed with an equal volume of each of the following: normal monkey serum, Type 1 antiserum, Type 2 antiserum, and Type 3 antiserum. These mixtures were then inoculated into groups of five roller tube cultures. The group of cultures containing antiserum homologous to the patient's virus showed no degenerative changes when examined seven days later, while all the other tubes showed typical cytopathogenic changes. Occasionally, an agent was isolated which was not neutralized by any of the three type antisera, and hence could not be identified. Animal inoculation failed to reveal the presence of either poliomyelitis or Coxsackie viruses in these cases.

Our results to date may be summarized as follows:

Year	Location	Type 1	Type 2	Type 3	Unidentified
1948	Ontario	3			
1949	N.W.T.	3			
	Ontario	2			
1950	Ontario	1		1	
1952	Nova Scotia	1			
	Ontario	7		2	8
	Manitoba	3			
	Saskatchewan	3			1
	British Columbia	1		3	1
1953	Y.T.	6			
	Ontario	5			
		35	0	6	10
		41			

Attempted Production of Allergic Encephalomyelitis with Duck-Embryo Suspensions and Vaccines.

J. O. MACFARLANE and C. G. CULBERTSON, *Eli Lilly and Company, Indianapolis, Indiana.*

RECENT RESEARCH has demonstrated the possible use of duck embryos as a source material

for rabies and possibly other virus vaccines. A study was undertaken to determine whether duck-embryo suspensions could produce allergic encephalitis in guinea pigs, as has been demonstrated with rabbit brain and cord suspensions and vaccines.

Various age duck-embryo suspensions and duck-embryo rabies vaccines suspended in Freund's adjuvants were injected subcutaneously into guinea pigs. Similar preparations from rabbit brains were injected as controls. Extended periods of observation for ascending paralysis, central nervous system involvement and numerous histological examinations were used to evaluate the reactions. Of eighty-three animals injected with duck-embryo materials, two (2.4%) developed definite encephalomyelitis. Seven additional animals (8.4%) were questionably affected. Of twenty-four animals injected with rabbit-brain preparations, twenty-one (87.5%) developed encephalomyelitis and one (4.2%) was questionably affected. Duck embryos therefore contain a smaller amount of the paralytic factor than rabbit brain. This is a more significant difference than the percentages indicate, since most of the duck-embryo suspensions contained from two to four times the tissue concentrations used in the brain preparation. Duck embryos are substantially free of the encephalomyelitic factor, yet brain tissue from adult ducks contains the factor in quantities approximating that in rabbit brain.

Post-vaccinal paralysis after rabies vaccination might be materially reduced or completely eliminated by use of a duck-embryo rabies vaccine.

Studies on the Propagation of Viruses in the Mammary Gland of Ruminants.

CHARLES A. MITCHELL, R. V. L. WALKER and G. L. BANNISTER, *Animal Diseases Research Institute, Hull, P.Q.*

ATTENTION IS DIRECTED to the possibility of propagating some viruses in the bovine mammary gland. Preliminary experiments with the gland of the goat are also described. It is pointed out that not only do some viruses propagate for approximately ten days in the gland, but this is followed by the production in the host of neutralizing antibodies in the quarter inoculated and also in the blood stream.

Isolation and Identification of Polysaccharides Derived from Crude Mallein and Culture Filtrates of *Malleomyces mallei*.

E. ANNAU, H. KONST, and P. BOULANGER, *Animal Diseases Research Institute, Hull, P.Q.*
In 1930 Sakamoto succeeded in separating from broth cultures of *Malleomyces mallei* a serologically active principle which he broadly identified as a carbohydrate. To our knowledge no further efforts have been made in later years to purify and chemically define this bacterial product and examine its antigenic properties. It appeared, therefore, of some interest to re-investigate this problem.

Culture filtrates of *M. mallei* strains No. 326 and No. 3873, grown on a synthetic medium, and the corresponding crude mallein prepared from strain No. 326 served as basic materials for isolation of the carbohydrate. From all three sources a polysaccharide of apparently identical composition could be isolated. Chemical analyses of the purified substances showed glucose and galactose as main components besides phosphorus and organically bound nitrogen. The antigenic capacity of the purified polysaccharide, examined on rabbits by the complement-fixation test, appeared to be relatively weak.

In Vitro Study of Antituberculous Drug Combinations.

LAKSHMI RAO, *Department of Hygiene and Preventive Medicine, University of Toronto.*

In vitro experiments with the BCG strain of *M. tuberculosis*, grown in Tween-albumin medium, showed that the combination of streptomycin with isoniazid and of streptomycin with an isonicotinyl hydrazone of p-hydroxy-benzaldehyde (compound 327) were more effective than any of the three agents used singly. These conclusions, based on visual observations of growth as well as on photoelectric turbidity measurements, were counter-checked by subculture of the washed growth sediments on Löwenstein-Jensen medium.

The favorable combined effect of streptomycin and isoniazid, as demonstrated *in vitro*, is in agreement with results of therapeutic trials in mice as well as with clinical observations.

The *in vitro* experiments showed the combination of isoniazid with compound 327 to be unfavorable, as contrasted with the marked synergism observed for the combination of streptomycin with compound 327.

Walrus Meat as a Source of Trichinosis in Eskimos.

E. KUITUNEN, *Division of Laboratories, Department of Health of Ontario, Toronto.*

DURING THE YEARS OF 1949-1953, extensive surveys for trichinosis have been carried out among land and aquatic mammals in the Canadian Arctic, in order to determine which animals used for food were responsible for trichinosis in Eskimos.

In this survey, over 3,000 animals were examined. Of these, 394 were walrus caught in different localities off Baffin Island, Northern Quebec, Cornwallis Island, Chesterfield Inlet, and Southampton Island. Of the 394 walrus examined, 17 were found to be infected with *Trichinella spirales* larvae. Fifteen of the infected walrus were caught off Southampton Island; muscle specimens of 2 infected walrus were obtained from Cape Dorset.

The only other report of trichinosis in walrus was made by a Danish scientist, who found 2 infected walrus off the west coast of Greenland.

Five Cases of Serologically Positive Toxoplasmosis with Isolation of the Parasite in One Instance.

M. W. FUJIWARA and J. MARION JOHNSON, *Department of Bacteriology, The Hospital for Sick Children, Toronto.*

FIVE CHILDREN whose ultimate diagnosis was congenital toxoplasmosis were admitted to The Hospital for Sick Children from June, 1952, to February, 1953.

The children varied in age from 10 days to 9 years, three being less than 4 months. In the two older children the condition had been present from birth or shortly thereafter. All had clinical signs referable to the eyes—chorioretinitis or microphthalmia. All but one had cerebral manifestations—areas of calcification with or without cerebral atrophy and hydrocephalus. The essential criterion for diagnosis was a positive Sabin dye antibody test in a titre of 1/256 or higher. The mothers showed serological evidence of infection. The toxoplasmin skin test was not consistently positive.

From one child who died at 4 weeks, a toxoplasma strain (L.F.) was isolated from ventricular fluid and brain tissue by serial passage through mice. This strain had typical morphology and killed mice regularly on the fourth or fifth day.

The standard R.H. strain of toxoplasma, obtained from Feldman, gave dye test results in our hands comparable to those done by Feldman on identical sera. However, when strain L.F. was used in the dye test, the results were unsatisfactory. There are some points of difference between the two strains, but serological differences have not been shown.

Generalized *Cryptococcus neoformans* Infection in a Dog.

D. L. T. SMITH, *Ontario Veterinary College, Guelph*, J. B. FISCHER, *Division of Laboratories, Department of Health of Ontario*, D. A. BARNUM and A. H. KENNEDY, *Ontario Veterinary College, Guelph.*

AN INCREASED incidence of fungus infection in animals is indicated by the number of reports which have appeared recently in veterinary literature. This trend may be apparent rather than real due to the employment of more exact diagnostic methods.

A case of European blastomycosis (cryptococcosis or torulosis) caused by *Cryptococcus neoformans* (*Torula histolytica*, *Debaromyces neoformans*) in a dog is reported.

The condition was diagnosed as a fungus infection on examination of a biopsy. On autopsy the nose, tongue, inner surfaces of lips and cheeks, nasal chambers, trachea, lung, mediastinal lymph nodes and spleen were found to contain lesions. Microscopically the lesions consisted of characteristic yeast-like bodies varying in size and surrounded by a thick capsule. These

bodies were separated by a space from the delicate granulomatous reaction to their presence.

The yeast was grown on Sabouraud's agar, identified, and its pathogenicity established by animal inoculation.

The potential of this dog as a disseminator of *Cryptococcus neoformans* through saliva, nasal discharge and exudate from the paws is apparent.

A Dermatophyte Infection in Chinchillas Transmitted to Man.

H. C. ROWSELL, A. H. KENNEDY, *Ontario Veterinary College, Guelph*, and J. B. FISCHER, *Division of Laboratories, Department of Health of Ontario*.

IN MAY of this year, an unidentified disease of the fur and skin of chinchillas occurred in the colony maintained at the Ontario Veterinary College. This disease spread throughout the entire colony even to the newborn in spite of attempts to isolate the diseased animals in one room. The common observations were an excoriation of the tail, with subsequent scab development and loss of hair. The lesions spread from the tail to the mouth and legs. In some cases the animal lost most of its fur. The appearance of the lesions varied, but usually they had a dry, scaly centre with a moist erythematous eczematoid periphery. No animals were lost as the result of this infection.

Hair and skin from infected animals planted on Sabouraud's dextrose agar and incubated at 25° C. yielded *Trichophyton mentagrophytes*. This dermatophyte readily infected guinea pigs whose backs had been scarified.

An adult human female (L.M.) whose duty it was to treat the infected chinchillas developed an eczematoid condition after exposure to the infection for about one month. A dermatophyte, similar to that isolated from the chinchillas, was cultured. Three to four weeks after primary infection, L.M. developed a secondary skin rash over the back and chest. This was diagnosed by her physician as an allergic reaction, a dermatophytid or "id" reaction. One other case of transmission of this dermatophyte from chinchillas to man was observed. This report is believed to be the first in Canada of the transmission of a dermatophyte from chinchillas to man.

Family Epidemics of Ringworm Contracted from Cattle.

F. BLANK, *Department of Bacteriology and Immunology, McGill University*, and GIBSON E. CRAIG, *Department of Medicine, Sub-Department of Dermatology, Royal Victoria Hospital, Montreal*.

A REPORT on three family epidemics of dermatomycosis among farmers is presented. In each case, several members of the family were affected, showing infections of the beard, scalp, and smooth skin. From all these lesions *Trichophyton discoides* was isolated as the causative organism. The same dermatophyte was isolated from infected cattle on these farms to which the origin of these infections was traced. There were, however, some cases in which infections were transmitted from person to person.

Sporotrichosis: A Report of Three Cases from the Toronto Area.

GORDON H. HAWKS, *Department of Bacteriology, St. Michael's Hospital, Toronto*.

Sporotrichum schenckii has been isolated from ulcerating lesions in three patients over the past two years. In each case the primary lesion was on a finger and the disease was of the lymphangitic type, with painless subcutaneous nodules in the forearm. One patient was employed in a green-house, but no definite plant contact could be established in the other two cases. All patients responded dramatically to treatment with potassium iodide by mouth.

Disseminated Cryptococcosis: Report of a Case.

T. C. BROWN, *Toronto General Hospital, Wellesley Division, Toronto*

A MAN who had recently suffered from a productive cough, chills and fever, was found to have widespread lymph node enlargement, hepatomegally, splenomegally, when admitted to

hospital. Further investigation revealed a profound haemolytic anaemia, severe leukopenia and reversal of the A-G ratio of the plasma proteins. Everything pointed to a diagnosis of malignant lymphoma, probably Hodgkin's disease. *Cryptococcus neoformans* was isolated from the pustules of an acneform rash, from the blood and necrotic plaques on the pharynx, but no clinical manifestations of central nervous system involvement were demonstrated. Mice, inoculated with the skin discharge, developed disseminated Cryptococcosis.

Autopsy established the granulomatous reaction to *Torula* as the basis for the entire clinical picture. Almost all the viscera were affected, particularly those of which the reticulo-endothelial system forms a major component, i.e., liver, spleen, bone marrow and lymph nodes. Only sparse microscopic lesions were found in a grossly normal central nervous system, although the organism was cultured from the cerebrospinal fluid.

The secondary haemolytic anaemia and leukopenia in this case, resulting from the extensive destruction of the bone marrow, and the magnitude of the visceral involvement in the face of the minimal cerebral changes, make this case unusual. The upper respiratory system was thought to be the focus of infection, and the extensive spread was through the blood stream and lymphatics.

There is no published account of a previous case of disseminated Cryptococcosis from Canada, although approximately 30% of the 200-odd cases of Torulosis reported to date have been of the systemic type.

Nocardiosis: Report of Two Cases.

MARION ROSS, *Sunnybrook Hospital, Toronto.*

TWO CASES are reported of infections caused by the acid-fast species of *Nocardia*—*Nocardia asteroides*—occurring in veterans in the Toronto area.

One of these was the classical type of primary pulmonary infection followed by widespread bloodstream dissemination and terminating in brain abscess (Eppinger, 1891). The patient was admitted to hospital several months after the onset of his illness, during which period the diagnosis was pulmonary tuberculosis. The fungus was isolated from sputum, bronchial aspirations, and aspiration from lung abscess during life and from all of the organs after death. There was no appreciable response to penicillin or sulphadiazine therapy.

The second infection occurred in a case of chronic myelocytic leukaemia. It presented as a subcutaneous abscess of the thigh. The fungus was isolated from the abscess and also from the sputum. Following sulphadiazine therapy the lesion in the thigh healed completely and the fungus disappeared from the sputum. Three months later the patient developed signs of a brain abscess and died. At post-mortem the fungus was isolated from the brain abscess, but cultures of the lungs and the site of the healed lesion on the thigh were negative.

Mention is made of a third possible case in which complete mycological studies could not be made.

Blastomycosis: Case Report.

PHILIP GREEY, *Banting Institute, University of Toronto.*

A CASE of blastomycosis with primary localization in the larynx is presented. Treatment with Stilbamidine resulted in apparent complete healing.

Infections experimentales avec des colibacilles pathogenes. Essais d'immunisation active et passive.

ARMAND FRAPPIER et SORIN SONEA, *Département de bacteriologie de la faculté de médecine et Institut de Microbiologie et d'Hygiène de l'Université de Montréal.*

DES GRANDES DOSES sont nécessaires pour produire la mort des souris par injection intrapéritonéale de colibacilles OIII-B4 ou O55-B5.

L'embryon de poulet de 11 jours s'avère un animal plus sensible, la dose L50 étant de quelques dizaines de bactéries.

Des expériences préliminaires d'immunisation active des souris avec les eaux de lavages filtrées d'une culture de colibacilles OIII-B4 montrent une protection partielle.

Le sérum des lapins immunisés avec les mêmes eaux de lavage protège partiellement les embryons de poulet inoculés avec la souche homologue.

Experimental Nephritis due to Type-Specific Streptococci.

R. W. REED and B. H. MATHESON, *Department of Bacteriology, Dalhousie University, Halifax.*

SEVERAL STRAINS of type 12 streptococci recovered from throat cultures in widely separated outbreaks of acute glomerulonephritis have been used in these studies. Localized infection of rabbits with these strains has resulted in the appearance of hypertension, albuminuria and hematuria eighteen days following infection. Intravenous injection of filtrate from these cultures results in a similar picture eight days after the beginning of treatment. Animals infected locally with other serological types of streptococci and with unrelated bacteria did not develop hypertension or urinary abnormalities. The significance of the clinical and pathological findings and their relation to acute glomerulonephritis in man is discussed.

Studies on Spore Germination.

P. C. FITZ-JAMES, *Department of Bacteriology and Biochemistry, University of Western Ontario, London.*

THE CHANGES in the phosphorus fractions and water content have been correlated with the changing cytology of germinating *Bacillus cereus* and *B. megaterium* spores.

The results indicate that the resting spore undergoes an initial period of adjustment, during which the water content rises from about 5% to 50% and simultaneously liberates solids. This is followed by a period of synthesis, during which phosphorus is assimilated, nucleic acid and phosphate polymers are synthesized, and the vegetative cell structure is established.

An Epidemic of Infectious Hepatitis Affecting a Rural Community in Canada.

R. M. KING, ANNE QUIGLEY, *York County Health Unit, Newmarket, Ontario*; J. C. SINCLAIR, *Department of Medicine, University of Toronto*; and C. E. VAN ROOYEN, *Connaught Medical Research Laboratories, Toronto.*

Numerous epidemics of infectious hepatitis have occurred throughout Canada during the past few years.

The best known of these have been those described at Mount Allison University, Sackville, N.B., by Dr. Roy Fraser, during 1930-31. A second epidemic occurring in the Foothills district of Alberta was reported by Somerville and Clark in 1943-44, and a third at Kingston, Ontario, reported by Major R. D. Barron, during 1949-50.

The present description provides another account of the epidemiological characteristics of 47 cases of infective hepatitis as it affected a small rural community situated in the suburbs of Toronto over the period 1952-53.

We have studied the age and sex incidence of cases, and their seasonal distribution, as well as other aspects, such as the living conditions of the affected community. We have also attempted to offer some explanation for the high incidence of family cases which appeared to be a feature of the epidemic under study. A number of factors of possible aetiological significance are discussed.

Tests for Hepatic Function, Their Interpretation and Significance.

J. C. SINCLAIR, *Department of Medicine, University of Toronto.*

ALTHOUGH fundamentally the diagnosis of infectious hepatitis depends on the clinical features, some help may be obtained from carefully selected liver-function tests. Early in the course of

the illness, before the appearance of jaundice, tests for bile and urobilin in the urine may prove of value. In following the course of the disease it is useful to have certain of the functions of the liver checked at regular intervals. Thus an occasional relapse may be detected at an early stage. As well, the results of such serial tests should be correlated with the clinical picture when deciding if duration of bed rest and later of convalescence has been adequate.

The Use of Calcium Alginate, A Soluble Material, in the Investigation of Cleansed Eating Utensils.

ROBERT M. CAIN,* Lt. (j.g.), U.S.N.R., and HOWARD STEELE, HM. 2, U.S.N., *Navy Preventive Medicine Unit No. 4, U.S. Naval Training Center, Great Lakes, Illinois.*

THIS PAPER presents data that have recently been gathered concerning the application of calcium alginate, a soluble swabbing material, in the bacteriological examinations of eating and drinking utensils. Information has been gathered to indicate that this is the superior material when compared with cotton wool being used in the same type of examinations.

The paper was published in full in the December issue.

Search for Antituberculous Compounds of Low Toxicity.

CHARLES O. SIEBENMANN and A. ZUBRYS, *Connaught Medical Research Laboratories, University of Toronto.*

IN CONTINUING the synthesis and chemotherapeutic study of hydroxy-substituted benzal-isonicotinyl hydrazones, it was found that the introduction of a CH_2COOH group into the isonicotinyl hydrazone of 2-hydroxy-3-methoxy-benzaldehyde leads to a compound of marked antituberculous activity and low toxicity for mice. The resulting compound, which is the isonicotinyl hydrazone of 2-aldehydo-6-methoxy-phenoxy-acetic acid, proved to be more effective against the 7-day-old experimental tuberculous infection in mice than the corresponding unsubstituted isonicotinyl hydrazone of 2-hydroxy-3-methoxy-benzaldehyde. It also proved to have a consistently higher antituberculous activity in mice than the isonicotinyl hydrazone of 4-aldehydo-phenoxy-acetic acid first described by Levaditi and Vaisman (1953). Like the latter compound, it appears to have no neurotoxic action.

Good antituberculous activity in mice was also found for the isonicotinyl hydrazone of 2-aldehydo-phenoxy-acetic acid.

*Lt. Cain is now with the Department of Bacteriology, Naval Medical School, National Naval Medical Center, Bethesda 14, Maryland.

Some Further Data on the Causes of Stillbirth in Ontario

A. H. SELLERS, M.D., D.P.H.

Director

Division of Medical Statistics, Department of Health for Ontario

AND

I. M. JUDSON

Statistician

Office of the Registrar-General for Ontario

REGISTRATION of stillbirths has been carried out in Ontario since the first Act for the Registration of Births, Marriages, and Deaths was passed by the Legislature in 1869. Until 1906, the numbers of stillbirths registered as deaths were shown in the cause-of-death tables under the heading "XI. Malformations, etc.". From 1907 to 1911, stillbirths were shown under a separate title, "XV. Stillbirths", and the figures were included in the totals. Beginning in 1912 stillbirths were excluded from the numbers of births and deaths to conform with the practice in other countries; for comparison with other years, the numbers of births and deaths from 1897 to 1912, excluding stillbirths, were given.

Commencing in 1921, data on numbers of stillbirths registered and stillbirth rates were supplemented by statistics on stillbirth by age of mother. In 1939 a special stillbirth registration form was introduced to supersede dual registration as births and as deaths. This form contains special medical questions in addition to the standard medical certificate of cause of death.

The official stillbirth statistics published to date have served to indicate

the size of the problem and its trend over the years. These data indicate a reduction in the stillbirth rate from 43.6 per 1,000 live births in 1922 to 38.3 in 1931, 28.8 in 1941, and 17.2 in 1951. Nevertheless, for every 1,000 live births in 1951, there were 17 stillbirths, and there continues to be a pressing need for statistical data on the causes of stillbirth* (*foetal death*) to measure more clearly the present extent of the problem and to assist clinicians and public health workers in the study of neonatal and foetal mortality.

Two much earlier publications relating to causes of stillbirth in Ontario were based on returns made under the Public Hospitals Act of Ontario (1, 2). These indicated what could be learned from available records and focussed attention on existing schemes of classification. No further Ontario data on the causes of stillbirth have been published. Problems in the assignment and classification of the recorded causes of stillbirth have thus far been a large factor in postponing routine publication of such statistics, although the primary information has been available. Another factor in deferring production of such data has been their

*The Vital Statistics Act for Ontario (1950) defines a stillbirth as "the complete expulsion or extraction from its mother after the 28th week of pregnancy of a foetus which did not at any time after being completely expelled or extracted from the mother breathe or show any other sign of life."

presumed unreliability in the absence of autopsy in the great majority of instances.

Since the basic data for the production of statistics on the causes of stillbirth are being recorded by physicians on medical certificates of stillbirth, and since such statistics are needed for teaching and research purposes, it was decided to prepare and present without comment a trial tabulation for 1952 despite the technical difficulties of assignment and any inherent limitations in the original information. Such a tabulation, besides indicating what can be produced now, may draw attention to the need for improvement in the quality of the data and suggest an approach which might best be made to accomplish this, and also point up any defects or weaknesses in the classification of causes of stillbirth used.

In this trial, assignment of the causes of stillbirth was carried out in accordance with the present general practice in cause-of-death selection (i.e., using the physician's preference) as set out in the Manual of the International Statistical Classification of Diseases, Injuries, and Causes of

Death (WHO, 1948). The causes of stillbirth were classified in accordance with the stillbirth section of the "Y" code (Y30-Y39), using all decimal sub-divisions.

Findings

Of the 2,076 stillbirths registered during the year, 49.1 per cent occurred at or near term and 50.5 per cent were recorded as less than 38 weeks' gestation (Table I).

The causes of stillbirth in ten major categories by age of mother are set out in Table II. A detailed tabulation of the causes of stillbirth by period of gestation is set out in Appendix A. These data provide some useful information on the relationship between cause of stillbirth, age of mother, and period of gestation.

It is expected that these statistics for the Province of Ontario will be of interest to clinicians and public health workers. More important, it is hoped that publication of these data will provoke interest in and discussion of the practicability and usefulness of the regular production of data on stillbirths by cause, with cross-classifications where indicated.

TABLE I
STILLBIRTHS BY AGE OF MOTHER AND PERIOD OF GESTATION
ONTARIO, 1952

Age of Mother	Period of Gestation (weeks)					Total
	28-32	33-37	38-40	41+	N.S.	
Under 20	34	37	50	10	-	131
20-24	102	137	179	41	3	462
25-29	131	154	220	52	1	558
30-34	99	115	168	63	1	446
35-39	63	95	126	36	2	322
40 & over	26	50	53	10	1	140
N.S.	4	1	8	4	-	17
TOTAL	459	589	804	216	8	2,076
Per cent	22.1	28.4	38.7	10.4	0.4	100.0

REFERENCES

1. Sellers, A. H. *Canad. Pub. Health J.*, 1937, 28: 22.
2. Sellers, A. H. *Canad. Pub. Health J.*, 1937, 28: 282.

TABLE II
CAUSE OF STILLBIRTH BY AGE OF MOTHER
ONTARIO, 1952

I.S.C. Code Number	Cause of Stillbirth	Age of Mother			Total	
		Under 25	25-34	35 & over	Number*	Per cent
Y30	Chronic disease in mother	7	10	14	31	1.5
Y31	Acute disease in mother	2	8	4	15	0.7
Y32	Diseases and conditions of pregnancy and childbirth	79	101	64	247	11.9
Y33	Absorption of toxic substances from mother	—	—	—	—	—
Y34	Difficulties in labour	72	107	48	228	11.0
Y35	Other causes in mother	5	11	6	22	1.1
Y36	Placental and cord conditions	149	316	163	632	30.4
Y37	Birth injury	17	41	12	70	3.4
Y38	Congenital malformation of foetus	150	204	57	414	19.9
Y39	Diseases of foetus and ill-defined causes	112	206	94	417	20.1
TOTAL		593	1,004	462	2,076	100.0

*Includes 1, 2, or 3 cases for which age was not stated; 17 cases in all.

APPENDIX A
CAUSES OF STILLBIRTH BY PERIOD OF GESTATION
ONTARIO, 1952

I.S.C. Code Number	Cause of Stillbirth	Recorded Period of Gestation (weeks)				
		28-32	33-37	38-40	40 & over	Total*
Y30	Chronic disease in the mother	8	13	10	—	31
Y30.2	Diabetes mellitus	3	5	5	—	13
Y30.3	Chronic disease of circulatory system	1	3	3	—	7
Y30.4	Chronic disease of genito-urinary system	1	4	1	—	6
Y30.5	Other chronic disease	3	1	1	—	5
Y31	Acute disease in the mother	2	5	8	—	15
Y31.1	Influenza	—	1	3	—	4
Y31.3	Other acute respiratory disease	—	—	1	—	1
Y31.4	Other acute disease or condition	2	4	4	—	10
Y32	Diseases and conditions of pregnancy and childbirth	67	93	69	17	247
Y32.2	Haemorrhage without mention of placental condition	19	19	16	2	57
Y32.3	Toxaemia with convulsions during pregnancy or labour (eclampsia)	10	23	10	2	45
Y32.4	Other toxaemias of pregnancy	34	48	42	12	136
Y32.5	Infection (ante- and intra-partum)	4	3	1	1	9
Y34	Difficulties in labour	15	38	131	42	228
Y34.0	Difficult labour with abnormality of bones of pelvis	—	4	4	1	9
Y34.1	Difficult labour with disproportion but no mention of abnormality of pelvis	—	3	16	2	21
Y34.2	Difficult labour with malposition of foetus	12	22	80	23	139
Y34.3	Difficult labour with abnormality of forces of labour	1	1	5	4	11

APPENDIX A —Continued

I.S.C. Code Number	Cause of Stillbirth	Recorded Period of Gestation (weeks)				
		28-32	33-37	38-40	40 & over	Total*
Y34.4	Difficult labour with operative delivery	1	4	10	3	18
Y34.5	Difficult labour with abnormality of organs or tissues of pelvis	—	2	4	1	7
Y34.6	Difficult labour without mention of under- lying condition	1	2	12	8	23
Y35	Other causes in the mother	6	7	6	2	22
Y35.0	Fall	4	4	1	2	12
Y35.1	Other accident or violence	—	1	—	—	1
Y35.2	Overexertion	1	1	—	—	2
Y35.3	Other and ill-defined causes in mother	1	1	5	—	7
Y36	Placental and cord conditions	139	184	254	53	632
Y36.0	Cord condition without mention of placental abnormality	19	38	103	17	178
Y36.1	Placenta praevia	19	17	17	9	62
Y36.2	Premature separation of normally im- planted placenta	65	85	81	9	241
Y36.3	Placenta praevia with cord abnormality	1	—	1	—	2
Y36.4	Premature separation of normally im- planted placenta with cord abnormality	4	1	4	2	11
Y36.5	Placental infarct	7	9	16	4	36
Y36.6	Other abnormality of placenta and cord	24	34	32	12	102
Y37	Birth injury	2	13	44	11	70
Y37.0	Birth injury with abnormality of bones of pelvis	—	1	3	1	5
Y37.1	Birth injury with abnormality of organs or tissues of pelvis	—	—	1	—	1
Y37.2	Birth injury with disproportion but no mention of abnormality of pelvis	—	—	7	1	8
Y37.3	Birth injury with malposition of foetus	—	1	11	4	16
Y37.4	Birth injury with abnormality of forces of labour	—	—	1	1	2
Y37.5	Operation causing mutilation of foetus	—	3	3	1	7
Y37.6	Other operation for delivery	—	—	4	—	4
Y37.7	Birth injury with difficult labour but without mention of underlying condition	1	2	3	—	6
Y37.8	Birth injury due to other or unspecified cause	1	6	11	3	21
Y38	Congenital malformations of foetus	102	134	132	45	414
Y38.0	Anencephalus	51	75	58	21	206
Y38.1	Hydrocephalus	22	27	46	8	103
Y38.2	Spina bifida	12	9	9	6	36
Y38.3	Other malformation of the central nervous system	6	3	3	2	14
Y38.4	Malformation of the cardiovascular system	1	—	2	1	4
Y38.5	Malformation of other specified system or part	3	3	3	2	11
Y38.6	Monster	6	5	5	3	19
Y38.7	Other and unspecified malformations	1	12	6	2	21
Y39	Diseases of foetus and ill-defined conditions	118	102	150	46	417
Y39.0	Syphilis	—	1	—	—	1
Y39.2	Erythroblastosis	25	25	28	5	83
Y39.3	Other cause originated in the foetus	—	2	4	—	6
Y39.4	Maceration, cause not specified	14	14	13	4	45
Y39.5	Other ill-defined cause	78	59	84	28	249
Y39.6	Cause unspecified	1	1	21	9	33
TOTAL		459	589	804	216	2,076

*Includes 1 or 2 cases for which period of gestation was not stated; 8 cases in all.

NEWS

British Columbia

A HOSPITAL INSURANCE statistical research project was recently approved by Ottawa under Federal Health Grants. The research will concern an analysis of all phases of hospitalized illness in British Columbia under Hospital Insurance: the relationship of hospitalized illness to certain other factors, such as prepaid medical plans, co-insurance and special categories of patients, etc., and studies of certain administrative problems in connection with hospital insurance which may have a bearing on the quality and quantity of health care available to the population.

A CONTRACT has been let for the new Provincial Health Building in Vancouver. When completed, probably in a year and a half, the seven-storey structure will house offices of the Provincial Health Department, the Bureau of Special Preventive and Treatment Services, and the Divisions of Vital Statistics, Venereal Disease Control, and Laboratories, as well as certain voluntary agencies such as the Canadian Red Cross Society. The top floor will be the new location of the Red Cross Blood Donor Service.

UP TO NOVEMBER 1953, British Columbia had recorded a total of 712 cases of poliomyelitis, with 23 deaths, as compared with 595 cases and 33 deaths for 1952. Gamma globulin is now available for contacts up to 16 years of age. The problem of getting cases from the outlying areas into the poliomyelitis treatment centre at Vancouver has been solved with the co-operation of the Royal Canadian Air Force. Special credit is due the Air Force for the admirable transportation facilities provided in emergencies.

PLANS HAVE BEEN approved to inaugurate an Industrial Nursing Unit in the Provincial Legislative Buildings. It is intended that this unit will serve as a basis for providing a consultative service on industrial nursing to private industry throughout the Province. Financing is through Federal Health Grants, as part of the Occupational Health Service of the Division of Environmental Management.

MR. RAYMOND H. GOODACRE, M.A., C.P.H., was recently appointed director of the Division of Public Health Education. He

is a graduate of Yale University and of the certificate course in Public Health at the University of Toronto.

Saskatchewan

DR. MILTON I. ROEMER, a medical-care specialist with wide experience in public health, recently joined the Department of Public Health as director of the Medical and Hospital Services Branch. He is the co-author with Dr. F. D. Mott, former deputy minister, of the book "Rural Health and Medical Care." A native of New Jersey, Dr. Roemer attended Cornell University, New York University, and the University of Michigan, where he obtained, in addition to medical training, master's degrees in sociology and public health. In 1941, after hospital training, he started public health work in venereal disease control. From 1943 to 1951, he was a commissioned officer of the United States Public Health Service, finishing with the rank of lieutenant-colonel. Dr. Roemer spent more than two years in the States Relations Division of the U.S. Public Health Service as consultant to American states on medical care programs. Later he became director of a county public health and training program in West Virginia. In 1949, Dr. Roemer was assigned to Yale University as associate professor of social and administrative medicine. In 1951, he joined the staff of the World Health Organization as chief of the Social and Occupational Health Section, which post he held till coming to Saskatchewan.

REVISION OF THE COURSE of study in health for elementary schools in Saskatchewan is in progress and a new departure in method is being attempted. Communities throughout the province are being asked to study school health in order to give the director of curricula suggestions as to what the new course should contain. The Departments of Education and Public Health are giving leadership to communities taking an active interest in this project. Two outcomes of community participation are hoped for: active help in deciding what is crucial in health education and increased cooperation among home, school, and community in sound health practices. If these are achieved, the teaching

of health in schools will be more realistic in terms of what the community practises in health.

STRONG EMPHASIS is being placed on public health teaching throughout the series of civil defence courses now being conducted at the Valley Centre, Fort Qu'Appelle, by the Civil Defence Branch of the Saskatchewan Department of Social Welfare and Rehabilitation. Three doctors have taken part recently in the training program. Dr. H. D. Jenner, medical superintendent, Fort San, spoke on medical problems in civil defence; Dr. G. D. Barnett, assistant medical superintendent, Fort San, on epidemics; and Dr. Irial Gogan, medical health officer for the Regina Rural Health Region, on regional health planning for disaster.

MISS M. P. EDWARDS, B.N., Reg.N., has been appointed director of nursing services for the Department of Public Health. She succeeds Miss Elizabeth Smith, B.A., Reg.N., who has retired after 10 years as administrator of these services. Miss Edwards trained at the Regina General Hospital and took a certificate course in public health nursing at the University of British Columbia. She has studied mid-wifery at Maternity Centre, New York, and in 1952 obtained a bachelor of nursing degree in public health from McGill University. Since 1942, when she joined the public health department, Miss Edwards has held posts as staff nurse and field supervisor. She also acted, for short periods, as senior public health nurse in the North Battleford, Moose Jaw, and Swift Current Health Regions.

Manitoba

THE DENTAL CLINIC of the Manitoba Department of Health and Public Welfare, recently giving dental care to the children of service personnel at Camp Shilo, was visited by medical, dental, and health representatives, as well as a number of officials and officers of the Prairie Command, on November 24.

This is the fourth consecutive year that the clinic has operated successfully in Shilo. The clinic is open for some forty days while a staff of four dentists and two chair assistants take care of approximately 500 children.

In addition to the dental clinic, the party also inspected the hospital, living quarters, barracks, kitchen, and food storage.

Those in the party included Dr. Morley

Elliott, Deputy Minister of Health; Dr. W. J. Riley, President of the Manitoba Dental Association; Dr. H. R. Stewart, Director of Dental Services, Department of Health and Public Welfare; Major-General N. E. Rodger, G.O.C., Prairie Command; Lieut.-Col. MacGowan, Dental O.C., Prairie Command; Colonel D. Menard, Garrison Commander, Camp Shilo; and Colonel C. Wood, C.M.O., Prairie Command.

Ontario

A JOINT COMMITTEE of the Ontario Public Health Association and the Ontario Department of Health is studying recording and record forms used in the maternal and child health services including the school age group. The objectives are to improve the service to the family and the individual and facilitate the interchange of information between communities. A questionnaire is being circulated to determine what information is most useful to health workers at the various stages of the child's development. All health workers who received a copy of the questionnaire are urged to mail in their complete forms at their earliest convenience. Additional copies of the forms for those who may have been overlooked will be sent upon request to the office of the Ontario Public Health Association at 150 College Street, Toronto 5.

RICHARD C. MONTGOMERY, M.B., B.Sc., Medical Officer for the Manufacturers Life Insurance Company of Toronto, was elected president of the Association of Life Insurance Medical Directors at their 62nd annual meeting, in New York. Dr. Montgomery succeeds Dr. Earl C. Bonnett, medical director for the Metropolitan Life Insurance Company of New York. A graduate of the University of Toronto, Dr. Montgomery for several years did post-graduate work, both in the hospital and in the Department of Science at the University, before entering private practice in the city of Toronto. He joined the medical staff of the Manufacturers Life in 1927 and in 1929 became assistant medical officer. Since 1943 he has been medical officer for the Company. The 63rd annual meeting of the Association will be held in the Royal York Hotel, Toronto, October 13-15, 1954.

A MAJOR STEP forward in the treatment of mental illness was recorded in St. Catharines in November, when the James Norris Clinical Building was opened at the St. Catharines

General Hospital. Included in the new wing is a 22-bed mental in-patient clinic, designed primarily for the preventive treatment of mental illnesses. Premier Leslie Frost officiated at the opening, assisted by Health Minister Mackinnon Phillips.

A LARGE REPRESENTATION from the Ontario Department of Health was in attendance at the 81st annual meeting of the American Public Health Association, held recently in New York. Headed by the Deputy Minister of Health, Dr. John T. Phair, the delegation included Dr. DeWillet S. Puffer, Assistant to the Chief Medical Officer of Health; Dr. A. H. Sellers, Medical Statistics; Dr. R. P. Hardman, Epidemiology; Dr. L. E. Elkerton, Central Laboratory; Dr. George Miller, Venereal Disease Control; Dr. E. Mastro-matteo, Industrial Hygiene; and Miss M. A. Rutherford, Public Health Nursing.

New Brunswick

THE HONOURABLE J. F. McINERNEY, M.D., announced on October 30 that the Department had commenced operation of the Moncton Regional Laboratory. Dr. Ian MacLennan, a pathologist, has been appointed director. The Moncton Regional Laboratory is the first of four Branch Laboratories in the Province recommended as the result of the health survey in 1949. The new laboratory is to give better laboratory services to hospitals of the southeastern section of the Province. In the past, the Provincial Laboratory at Saint John had to serve the entire Province.

ON NOVEMBER 12 Dr. J. A. Melanson,

Chief Medical Officer, participated in the formal program marking the official opening by "snipping the ribbon" of the new Charlotte County Hospital at St. Stephen. The hospital has provision for 139 beds.

THE HONOURABLE J. F. McINERNEY, M.D., Minister of Health and Social Services, was principal speaker at the closing dinner of the Hospital Accounting Institute, which was conducted in Moncton November 17 to 19. Dr. McInerney reviewed the numerous advances made recently in the hospital services in the Province.

MR. GORDON FISHER has been appointed acting superintendent of the Boys' Industrial Home at Saint John, effective December 1, 1953. The Home is under the jurisdiction of the Department of Health and Social Services.

DR. A. M. CLARKE, Assistant Chief Medical Officer and Provincial representative on the National Advisory Committee on Rehabilitation, attended the meeting of the American Public Health Association in New York in November, and at the same time, visited several rehabilitation offices and clinics in New York and vicinity. Dr. Clarke also attended a meeting of the National Advisory Committee on the Rehabilitation of the Disabled at Toronto on November 18 and 19.

THE FIRST "EXTENSION" PACK of Brownies in New Brunswick was formed on November 26, at the Moncton Tuberculosis Hospital. Sixteen young patients were enrolled.

EMPLOYMENT SERVICE

Public Health Nurse required by York County Health Unit in a generalized program. Excellent transportation arrangements, health and accident insurance, and other attractive working conditions. Write to Dr. R. M. King, York County Health Unit, 126 Main Street, Newmarket, Ontario. 12/

District Supervisor required for Ottawa Health Department. Preferably with certificate in administration and supervision in Public Health Nursing. Generalized public health nursing program under Director of P.H.N. Blue Cross benefits and pension. Apply to Dr. J. J. Day, Medical Officer of Health, Transportation Building, 48 Rideau Street, Ottawa 2, Ontario. 12-1

Sanitary Engineer required immediately by the Health Department of the City of Ottawa. Permanent position with annual leave, car mileage allowance, and superannuation plan. Hospital and Medical Insurance plans available. Apply, in writing, stating qualifications, experience, and salary expected, to Secretary, Board of Health, Transportation Building, Ottawa, Ontario.

Public Health Nurses, bilingual, required by Prescott and Russell Health Unit. Minimum salary \$2,400, with allowance for previous experience and annual increments. Car provided. Blue Cross and sick leave. Apply to Dr. R. G. Grenon, Director, Prescott and Russell Health Unit, Hawkesbury, Ontario.

Sanitary Inspector, qualified, bilingual, required by Prescott and Russell Health Unit. Minimum salary: \$2,600, with allowance for previous experience and annual increments. Car allowance. Blue Cross and sick leave. Apply to Dr. R. G. Grenon, Director, Prescott and Russell Health Unit, Hawkesbury, Ontario.

Public Health Nurse: The Town of Strathroy requires the services of a fully qualified Public Health Nurse. Salary \$2,400 per annum, plus car allowance. Duties to commence as soon as possible. Please mail applications to John Eakins, Secretary, Board of Health, Strathroy, Ontario. 1/

PUBLIC HEALTH PHYSICIANS

British Columbia Civil Service - Department of Health

Salary: \$576. rising to \$668. for Physicians with public health training; \$556. rising to \$644. for experienced physicians, with opportunity for postgraduate training; \$480. rising to \$556. for physicians who have just completed internship.

Duties: To organize and develop local public health programs in health units; to supervise and direct the work of public health nurses and sanitary inspectors throughout the unit area; to be the medical health officer for the municipalities and school medical inspector for the district school boards; to act as secretary of the union board of health; generally to devise services to meet the health needs of the area.

Security: A generous Superannuation Plan.

Permanency: Transfers throughout the Public Health Service are offered without loss of seniority or Superannuation benefits.

Transportation: Travelling and car expenses are paid, and cars supplied when necessary. Further particulars may be obtained from the Deputy Minister of Health, Parliament Buildings, Victoria.

Applicants must be British subjects, preferably under 45 years of age. Further information and application forms may be obtained through the Civil Service Commission Offices, Weiler Building, Victoria, and 411 Dunsmuir Street, Vancouver 3. Completed applications should be forwarded to the Chairman, Civil Service Commission, Victoria.

